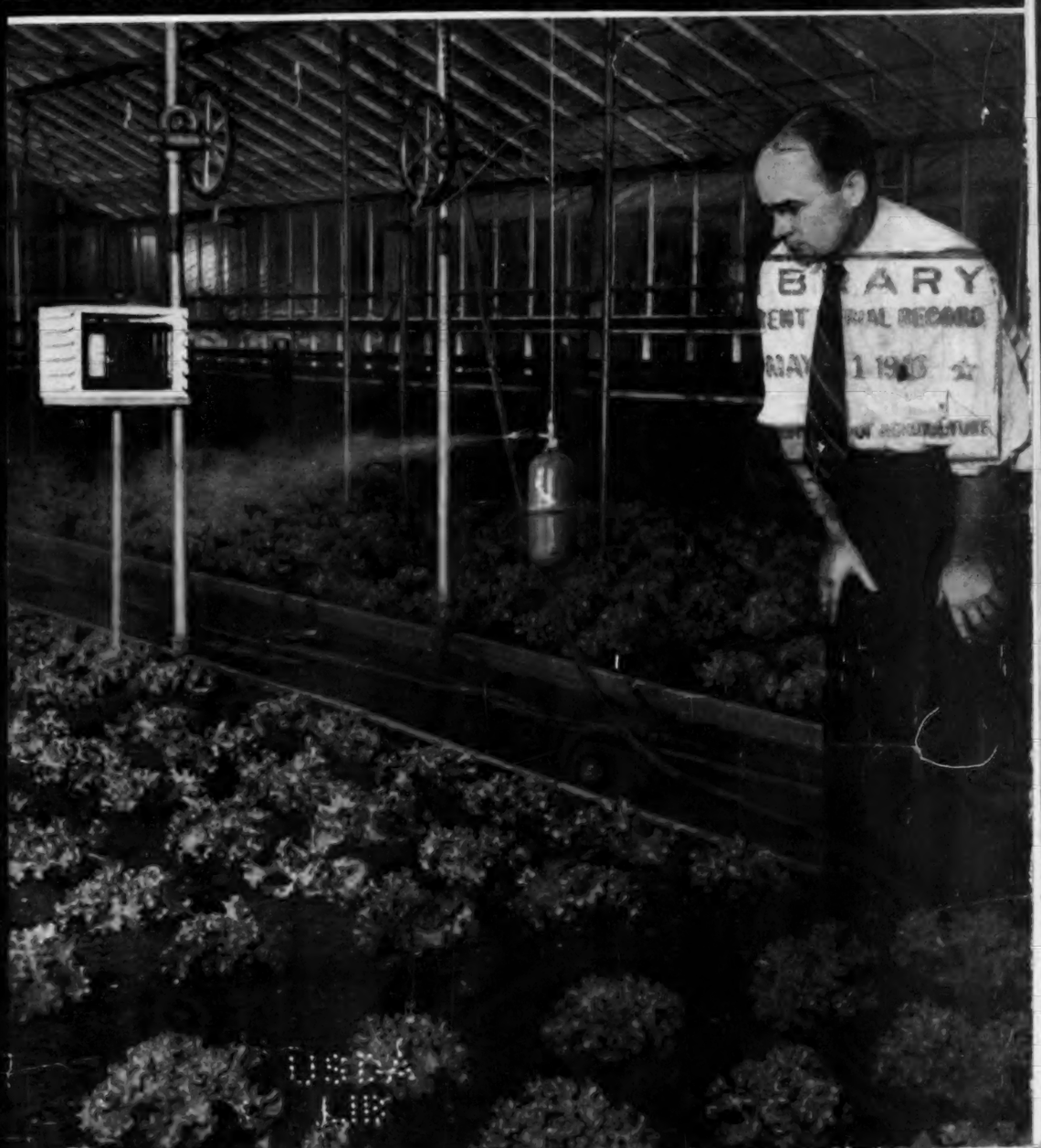
# AGRICULTURAL CHEMICALS

A MONTHLY MAGAZINE FOR MANUFACTURERS, PROCESSORS AND DISTRIBUTORS




A NEW ERA IN INSECT CONTROL
VELSICOL
1068*
New
KILLING POWER
New
RANGE OF EFFECTIVENESS
New
PHYSICAL CHARACTERISTICS
A reprint of the article on VELSICOL 1068 by Dr. C. W. Kearns, Dr. L. Ingle and Dr. R. L. Metcalf which appeared in the December 1945 issue of the Journal of Economic Entomology is now available for distribution.
Samples of VELSICOL 1068 (20% CONCENTRATION) for test purposes in the production of fly and roach sprays and residual-type sprays are obtainable on request as are samples of technical grade VELSICOL 1068 for experimental purposes in the agricultural field.
OTHER VELSICOL INSECTICIDE PRODUCTS
THE METHYLATED NAPHTHALENES**
VELSICOL AR-50 · VELSICOL AR-60 · VELSICOL AR-70 · VELSICOL NR-70
Correspondence is invited in regard to uses and formulations of the above materials.
* U. S. PATENTS PENDING
** U. S. PATENT NO. 2,347,265
U. S. A. A. F. PHOTO—ACME
VELSICOL Corporation
Manufacturers of Insect Toxicants • Aromatic Solvents • Synthentic Resins • Coresin Core Oils
General Offices: 120 East Pearson Street • Chicago 11, Illinois
New York: 11 Park Place, New York 7, N. Y.
Detroit: 408 Boulevard Bldg., Detroit 2, Mich.
Cleveland: 1900 Euclid Ave., Cleveland, O.

# NOW... A DEPENDABLE SOURCE FOR ALL YOUR DDT REQUIREMENTS

Ready to help you meet the tremendous demand for DDT Insecticides for sanitary and agricultural use, CYANAMID offers you an established, dependable source of supply for all your DDT needs. CYTOX DDT and CYTOX DDT Formulations are based on DDT-TECHNICAL, which meets Joint Army and Navy Specifications for DDT (J.A.N. D-56A).

CYTOX Formulations, to meet all DDT Insecticide requirements, include:

## Cytox 25% DDT Liquid Concentrate

CYTOX 25% DDT LIQUID CONCENTRATE is formulated for use in the manufacture of effective sprays for homes, hotels, public institutions and also for dairy barns, stables and similar structures, for the control of flies, mosquitoes, bedbugs, clothes moths, carpet beetles and other insects infesting enclosed areas.

It contains 25% DDT-TECHNICAL, completely dissolved and ready for dilution with kerosene or other petroleum vehicles. Deodorized kerosene is recommended for odorless household sprays and ordinary kerosene can be used in sprays for rough structures such as barns and stables.

CYTOX 25% DDT LIQUID CONCENTRATE is now available for immediate shipment in 10- and 55-gallon drums.

## Cytox 50% DDT Dust Concentrate

DDT dusts of any desired concentration can be prepared with CYTOX 50% DDT DUST CONCENTRATE for use in the control of insect pests on agricultural crops or the control of external parasites on man and animals. CYTOX DUST CONCENTRATE contains 50% DDT-TECHNICAL and can be mixed easily with inert diluents such as non-fibrous talcs and clays. It produces free-flowing, non-caustic dusts with excellent adhesion to plant foliage. These dusts will effectively control a wide range of insects.

## Cytox 50% DDT Wettable Powder

CYTOX 50% DDT WETTABLE POWDER is ready, by dilution with water, for outdoor sprays to control such insects as codling moth, gypsy moth, tent caterpillar, Japanese beetle, Colorado potato beetle and thrip. It also produces effective sprays and dips for the control of flies and ticks on cattle and other animals and for spraying barns and stables.

Write or phone today for additional information on the preparation of insecticidal dusts and sprays with CYTOX DDT CONCENTRATES, as well as specific recommended uses. Mail the coupon today. Your inquiry will receive prompt attention.

**AMERICAN CYANAMID & CHEMICAL CORPORATION**

*(A Unit of American Cyanamid Company)*

INSECTICIDE DEPARTMENT

32-M Rockefeller Plaza, New York 20, New York

*Branch Offices:* 628 Dwight Building, Kansas City 6, Mo.
2203 First Avenue, South, Seattle 4, Wash.; Azusa, Calif.

American Cyanamid & Chemical Corporation
Insecticide Department
32-M Rockefeller Plaza, New York 20, N. Y.

Please send additional information .... and prices .... on Cyanamid's new DDT Formulations:

CYTOX 25% DDT LIQUID CONCENTRATE.....
CYTOX 50% DDT DUST CONCENTRATE.....
CYTOX 50% DDT WETTABLE POWDER .....
CYTOX DDT-TECHNICAL (Setting Point 89° C. minimum).

*Name*.....
*Company*.....
*Address*.....
*City*..... *Zone*..... *State*.....

*Exactly as used by the U.S. Armed Forces*

**Your Sales Story is simple when you stock**

# INSECT-O-BLITZ


This self-spraying steel dispenser holds 16 oz., sufficient to treat 200 average rooms or average 5 room house approximately 40 times when used as directed.

- **Contains 3% DDT Aerosol Grade**
- **2% Pyrethrum (.4% Pyrethrins)**
- **Harmless to humans when used as directed**
- **Non Inflammable**

It's a sales story that's simple, effective and *true*. It clears up the confusion in the average person's mind when you tell him—"Yes, *INSECT-O-BLITZ is still* exactly the same as supplied to the U.S. Armed Forces."

INSECT-O-BLITZ—after a brilliant record of service overseas—is available in exactly the same formula and the same self-spraying sealed steel dispenser which was patented and recommended by the U.S. Department of Agriculture and used by the Armed Forces. It is still manufactured under Department licenses and no changes—either in constituent ingredients or in potency—have been made in releasing this war-proved insecticide for household use.

## DOOM TO INSECTS

INSECT-O-BLITZ packs an insecticidal "wallop" proved in various tests* to be an exceptionally effective method of insect pest control. It's the fast acting "One-Two" combination of

**PYRETHRUM for the Lethal Knockdown**
*2% of 20% concentrate equals .4% Pyrethrins*

**DDT for the Added Killing Effect**
*3% Aerosol Grade*

**U. S. Dept. of Agriculture reports one 16 oz. dispenser equal to 2 gallons, or more, ordinary insect spray; 10 times more effective according to tests by Peet-Grady Method.*

## BOOM TO SALES

INSECT-O-BLITZ is a fast-selling, high profit item for drug, department, hardware, chain stores, filling stations and similar outlets. Always a repeater wherever and whenever it has been stocked, dealers have ordered as much as 20 times the original order the second day; wholesalers have ordered second and third carloads the first month.

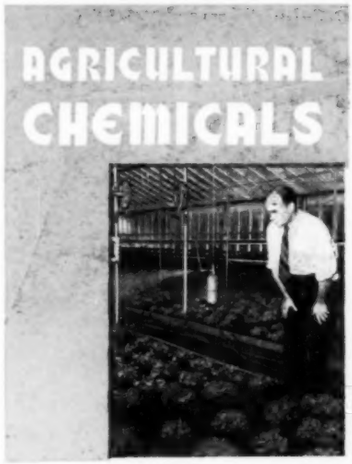
Make INSECT-O-BLITZ profits ring the cash register for you—now! Order from your local distributor or direct.

***Price List:* AEROSOL INSECT-O-BLITZ retail list price $3.00 per unit. Fair-traded, $2.95**
Subject to liberal trade discounts. FOB destination on 3 cases or more. Presently packed 24 per case.

INSECTICIDE DIVISION

**INDUSTRIAL MANAGEMENT CORP.**

***Sales Offices:* 639 So. Spring St., Los Angeles 14, Calif. • 38 So. Dearborn St., Chicago 3, Ill. • *Factory:* Valparaiso, Indiana**




**THIS MONTH'S COVER**

The effect of the aerosol method of insecticide dispersion is tested by entomologist Floyd F. Smith on pests that attack lettuce plants. The scene is a greenhouse at the Beltsville Research Center of the U. S. Department of Agriculture. The aerosol method of dispersion also offers promise in the application of plant hormones. U.S.D.A. photo by Knell.

**MAY, 1946**
**VOL. 1 NO. 1**

## *In This Issue:*



**AGRICULTURAL CHEMICALS**
**254 West 31st St., New York 1, N. Y.**

**Subscription Rates:** *One year* $3.00, *two years* $5.00. *In Canada one year,* $4.00.

*Published monthly on the 15th by Industry Publications, Inc. Advertising and editorial office, 254 W. 31st St., New York, N. Y. Advertising rates made known on application. Closing date for copy—25th of the month previous to date of issue.*

# Soluble 2,4-D
## Costs Less to Formulate

RECENTLY THE J. T. BAKER CHEMICAL CO. offered to the manufacturers of weed killers 2,4-D itself, and the sodium salt of 2,4-D. Because the sodium salt is soluble in water it costs less to formulate. This product is a chemical compound and not a mixture. There have been so many requests for further information, that we take this method of presenting some of the facts pertaining to this product.

### GENERAL

The chemical 2,4-D is 2,4-dischlorophenoxyacetic acid. It is a white powder of limited solubility in water. Since the acid form is not very soluble in water, it must first be dissolved in a "Carrier." A 10% to 15% solution of 2,4-D in a carrier is first prepared (temperatures above 125°F.), and this concentrate is dissolved in warm water to give a spray solution of the desired concentration. The acid can also be dissolved in water by adding 20-30% sodium carbonate. This apparently converts the acid form to the more soluble salt.

The sodium salt of 2,4-D, as supplied by Baker, is the monohydrate. It is also a white powder, and like the acid is a non-corrosive, non-inflammable material. It differs from the acid form of 2,4-D in that it is soluble in water. A 4% solution of the 2,4-D salt in water can be prepared at room temperature. A spray solution containing 0.1% 2,4-D can be easily prepared by dissolving 1 pound of sodium salt in 100 gallons of water directly, *no carrier being necessary.* A wetting agent can be incorporated either with the dry powder, or added to the final spray solution.

### METHOD OF APPLICATION

2,4-D is usually applied in an aqueous solution containing 0.1% 2,4-D. It is applied at the rate of 4-5 gallons per 1000 square feet on lawns, and 6-7 gallons per 1000 square feet (300 gallons per acre) on larger plants and in fields.

Recently, work has been done applying 2,4-D as a dust, using various carriers. The rate of application was 4 lbs. of dust per 1000 square feet. The use of dust does not appear to be a very economical way of applying 2,4-D. Furthermore, in using dusts there is danger of the destruction of desirable plants by the drifting of dust particles.

### FORMULATION OF 2,4-D

*With the production of the soluble salts of 2,4-D, such as the sodium salt produced by Baker, the use of a carrier is no longer*

# Facts You want to know

# Soluble 2,4-D

*necessary.* The salt can be dissolved directly in water (1 pound in 100 gallons of water) and a wetting agent added to the solution. It would also be possible to incorporate a solid wetting agent with the dry powder for small sales. Recently Marth and Davis of the Bureau of Plant Industry, U. S. Dept. of Agriculture, carried out some work comparing the action of the acid form of 2,4-D (in a carrier) with the sodium salt. In all their tests the *sodium salt dissolved in water containing a little laundry soap was about as effective as the expensive acid-carrier formulation.* Other wetting agents have been found very satisfactory. It is necessary to use a good wetting agent and spreader on plants having waxy foliage.

## WHERE CAN 2,4-D BE USED?

A great deal of work is being carried on all over the country to evaluate properly the position of 2,4-D as a weed killer. The present status is best judged by the reports given at the recent meeting of the North Central States Weed Control Committee in St. Paul at which results of the field tests carried out last summer were reported. The Committee definitely went on record as approving the use of 2,4-D against lawn and turf weeds.

Ragweed can be effectively controlled by 2,4-D. Even if the plant is not killed, the application of 2,4-D to the budding plant prevents the opening of flowers and the spreading of pollen. The results with poison ivy are still not conclusive.

The following general information is extracted from a Bureau of Plant Industry release dated July, 1945.

## WHAT WEEDS WILL 2,4-D KILL?

A solution of 2,4-D containing as little as 1 1/3 ounces of the chemical in 10 gallons of water (1/10 of 1 percent by weight) when used as a spray is deadly to many species of broad-leaved plants. Some species upon which this substance has been effective are—

| | | |
|---|---|---|
| Dandelion | Daisy | Pigweed |
| Narrow-leaf plantain | Heal-all | Three-seeded mercury |
| Lawn pennywort | Chickweed | Burdock |
| Broad-leaf plantain | Winter cress | Wild Mustard |
| Japanese honeysuckle | Pokeweed | Frenchweed |
| False strawberry | Curled dock | Wild lettuce |
| Annual morning-glory | Ragweed | Annual sow thistle |

## WHAT WILL 2,4-D DO TO GRASSES?

So far 2,4-D has not been found effective on crabgrass, quackgrass, Johnson grass, nutgrass, or other weedy grasses and sedges. It does affect bent grass, and anyone with a bent grass lawn should be cautious about this new treatment. A good point about the 2,4-D spray is that it does not hurt Kentucky bluegrass, annual bluegrass, redtop, fescue, and buffalo grass. It *will* kill or seriously retard the growth of White Dutch clover.

## WHEN IS 2,4-D USED?

Usually the best time to use 2,4-D sprays on lawns or other turf is in late spring or early fall, when the weather favors the growth of grass, rather than in extremely cold or hot, dry periods. The best time to use 2,4-D on farm weeds has not yet been determined. Lawns effectively treated with the 2,4-D carrier mixture will be free of dandelions and plantains for 2 to 3 months. Later it may be necessary to re-treat the area to kill seedling plants that have grown since the first spraying.

# BAIRD & McGUIRE, Inc.

**St. Louis, Mo.** **Holbrook, Mass.**

**STOCK DIPS**

**DISINFECTANTS**

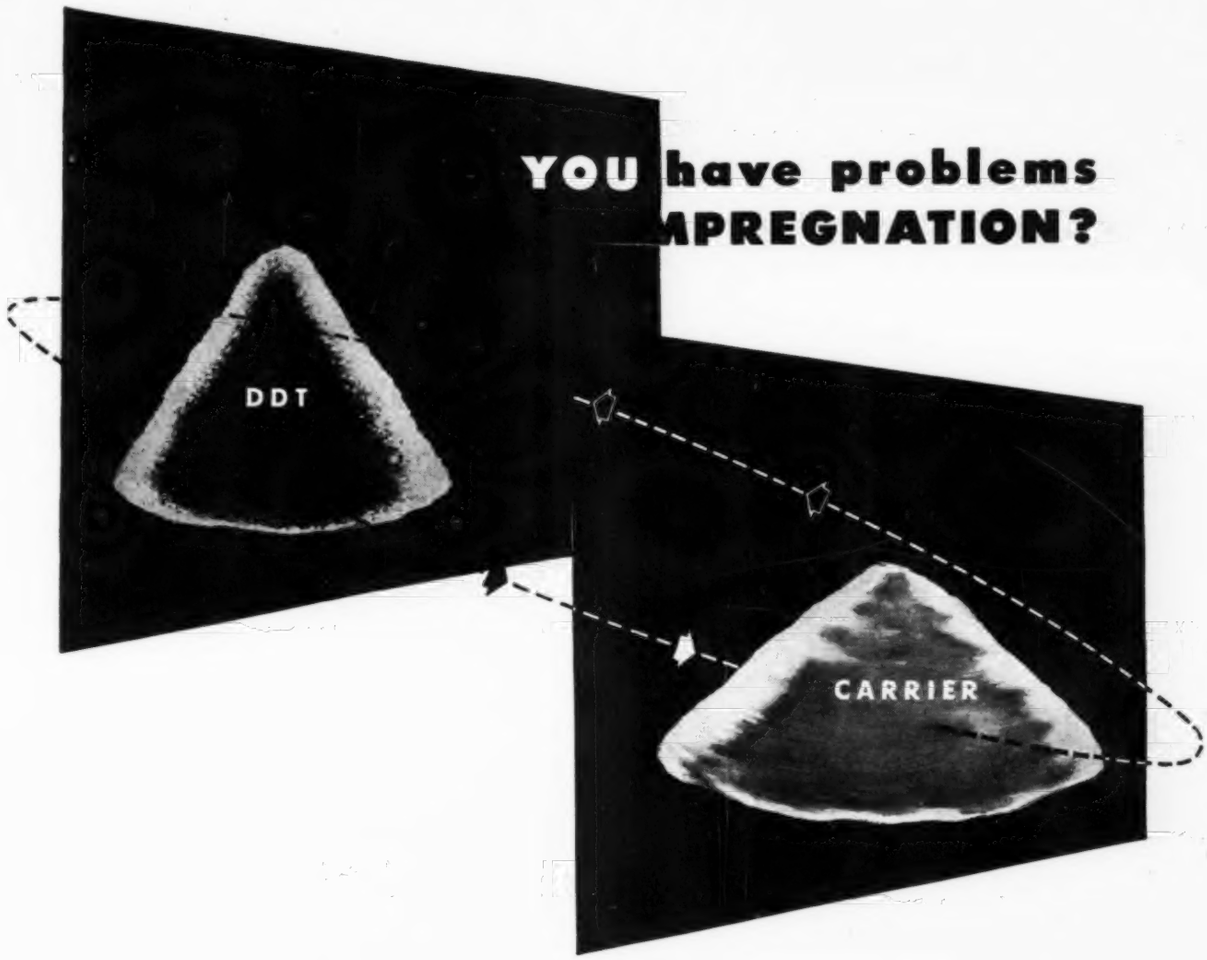
**INSECTICIDES**

**DDT**

**Crude Carbolic Acid**

**TANK CARS**
**CAR LOADS • DRUMS**

**TO MANUFACTURERS**
**DISTRIBUTORS ONLY**




The wax-like nature and tendency toward fusion exhibited by DDT present problems in the preparation and compounding of insecticidal powders and dusts. The finished mixture must retain required flowability — the grinding process simplified. Attaclay, the new, porous, finely divided insecticide carrier and diluent, has properties helpful in overcoming these mixing problems.

Over the range of concentrations currently in use commercially, ATTACLAY-DDT mixtures exhibit high flowability. Furthermore, the adoption of Attaclay as carrier and diluent in DDT mixtures always minimizes grinding problems.

Because of its chemical compatibility, Attaclay helps maintain high toxicity in DDT mixtures.

Whether your process involves use of DDT or other insecticides, Attaclay's unique properties as a carrier and diluent merit consideration. We shall be pleased to send an adequate sample for testing. Just write to

**ATTAPULGUS CLAY COMPANY**

**DEPT. P • 260 SOUTH BROAD STREET • PHILADELPHIA 1, PA.**


# PENICK BASIC INSECTICIDES

## *"nip 'em in the bud"*

Whether they fly, hop or crawl on the plant itself — whether they creep or walk, or run — whether they are grubs, worms or insects, PENICK has an effective basic insecticide, which, when mixed for the particular need, will "nip 'em in the bud."

Continuous tests conducted in our research laboratories prove the potency and toxicity of PENICK insecticidal bases.

PYRETHRUM POWDER: Our product assays .5% to 1.3% pyrethrins. Here is a range suitable to your needs. Many growers prefer it.

IMPREGNO: The pyrethrins are coated on the outside for efficiency and economy. Impregno is a dust concentrate with pyrethrins 2% and reduced by mixture with clay. Sulphur may be used with Impregno and talc if desired or required.

PYREFUME SUPER 20: assays 2 grams pyrethrins per 100 cc. PYREFUME SUPER 40 assays 4 grams per 100 cc. PYREFUME 100 assays 10 grams per 100 cc. All PYREFUME extracts are available in kerosene, odorless petroleum distillate base, pine oil, alcohol and ethylene dichloride.

FOLIAFUME: a combination pyrethrin-rotenone plant-spray concentrate for repackaging under your label. A pre-war favorite — ready to work again.

SABIDILLA SEED: in powdered form and formulated. An excellent leaf hopper control and for other use which manufacturers should investigate.

DDT 50% solution for residual spray; 50% dispersible or wettable powder 30% emulsifiable and DDT specialties.

Write for descriptive literature covering our entire line.

# THE EDITOR COMMENTS

WITH this, the first issue of AGRICULTURAL CHEMICALS, we offer to the industry a new magazine, one which we hope will fulfill a definite need in the field of agricultural insecticides, fungicides, herbicides, fertilizers, and other chemical products for agriculture. Although a number of scientific journals of highest repute, both national and sectional, are published today in the interests of economic entomology, animal husbandry, forestry, and the like, they are all essentially for the scientist. AGRICULTURAL CHEMICALS is designed primarily for the layman in the industry, and plans to serve the commercial interests of the field. As far as we know, there is no other publication at present giving full and specialized attention to the broad field of agricultural chemicals.

Editorial plans for AGRICULTURAL CHEMICALS are legion. Over the months and years to come, a rapidly expanding list of new products and equipment, new problems and new ideas will test the ability of industry and others to keep abreast of developments. AGRICULTURAL CHEMICALS will try to help in this respect. Its editorial light will be focused on all developments involving chemicals for agriculture, including problems arising out of their processing and use.

The chief aim of AGRICULTURAL CHEMICALS will be to disseminate full and accurate information to the industry,—the mixer, blender, repacker, distributor, custom sprayer, and others,—and to aid and encourage a broader and more effective distribution of its products. While its editorial policies will be wholly independent, it plans nevertheless to cooperate closely with industry trade and other associations for the general good. Although designed to be read primarily by the processing and distributing industry and others who supply, advise or service the farmer, orchardist, *et al*, large consumers of agricultural chemicals may in many instances find the publication of interest.

Our long-held belief that a need exists for a specialized magazine to cover the agricultural chemical field is confirmed by numerous letters received thus far from the industry and officials of state and federal governments. For the many expressions of good-will from these sources, we are deeply grateful. No effort will be spared to prove that we warrant the confidence expressed in us.

THUS far, the introduction of 2,4-D into the weed control field has not been accompanied by the succession of unfortunate mistakes which characterized the beginnings of DDT as an insecticide. Here and there, we note a statement in the daily press about 2,4-D which might lead to trouble by emphasizing the "miracle" character of this new weed killer. On the whole, however, the sale of 2,4-D has been tempered with conservatism aided by previous experience. There are not a thousand or more small firms waiting to enter a wild scramble to market as was the case when DDT was suddenly released for general use by WPB.

In the case of 2,4-D, there is also a patent, but differing from DDT to the extent that already a suit for declaratory judgment against the patent holder has been filed. Apparently, this move to bring the patent question to a head as quickly as possible is motivated by a desire to clear the atmosphere before more extensive marketing operations are undertaken. Also, it would seem that the apparent view of the company which has entered the suit,—that the patent will not stand up in the courts,—is shared by a majority in the industry with whom we have discussed the subject. However, this is a matter for the judges to decide. In the meantime, the marketing of 2,4-D products for weed control proceeds, but with such caution as the present situation would naturally engender.

# Education Needed!

A guest editorial written especially for the first issue of Agricultural Chemicals

**By George F. Leonard**

President, Agricultural Insecticide and Fungicide Association

PROVIDING the chemicals and other materials vital to protecting the nation's crops, gardens and livestock is the function of the agricultural insecticide and fungicide industry. For the materials and services of the industry, the farmer, rancher and gardener pay an estimated 100 million dollars annually. This is the bill, the insurance cost, if you will, for the protection of food and fiber crops, and of livestock, valued at five billion dollars annually.

Within the framework of this truly nationwide industry we observe manufacturing plants situated on both coasts and at points between, companies both large and small; we see warehouses, processors, re-mixers, dealers and a multiplicity of consumer outlets. The pattern of distribution, time-tested over the years, represents an evolution which underscores the necessity for having the proper materials at the point of need and in time for effective control.

Industry's materials are varied. They include the arsenicals, coppers, nicotine, sulfurs, fumigants, seed protectants, weed killers, hormones, new synthetics and many others. This variety contributes not alone to more effective control but also to the keener competition which in this, as in any industry, leads to increased efficiency.

Today the agricultural insecticide and fungicide industry is facing up to its postwar responsibilities. There is no time to dwell on industry's war record, satisfying as it has been to those of us who concentrated our efforts on the job of turning out chemicals for the farm front. Suffice it to say that the industry, aided by Government, provided the protective materials which helped the American farmer produce record breaking crops of food and fiber during the war years.

Within the Agricultural Insecticide and Fungicide Association we hold to the conviction that the job ahead is exactly the same job that confronts any industry whose membership believes in a competitive economy of full production and full employment. That job is to produce.

Happily, our industry has long had the technical "know how" and plant capacity sufficient to meet needs of the American farmer as well as export demands. Our industry also has the vision to give appropriate attention to research and development. Research budgets are up and scientific personnel has been increased. Improvements in distribution are being effected, services to consumer are being strengthened and enlarged. Throughout the industry, constructive measures have been taken to insure the faithful discharge of our post-war responsibilities to the American farmer.

The fact remains, however, that certain war-created shortages—rotenone, for example—are continuing. Supplies of arsenic and copper, among other essential raw materials, have been sharply curtailed because of strikes affecting suppliers. In this circumstance, while we hope for an early end of the labor difficulties, we are formulating plans for a 1946 season which may well tax the industry even more than any of the war years.

Major objective of the industry, of course, will be to provide protective materials when and where needed. The job ahead, particularly for 1946, is a challenging one. Industry must be prepared with substitutes where necessary. It must (and will) be alert to the need for special services as serious infestations are reported at widely-scattered points. Industry is still handicapped by shortages of labor, packages, and by transportation difficulties. But, despite these and other difficulties, industry hopes to see the farmer through *if* sorely needed raw materials are provided in time.

Looking beyond immediate problems, the long range view calls for recognition of the fact that the foundation of effective insect and plant pest control by the farmer is education. This applies not alone to the newer materials, of which DDT is but one. Rather, there is need for educational efforts which will broaden the scope of control and at the same time enhance the effectiveness of existing protective measures.

An educational program of this magnitude deserves the support

*(Continued on Page 35)*

Westchester-Biltmore Hotel, Rye, N. Y., Scene of AIF Spring Meeting.

# AIFA in Mid-Year Meeting

## Agricultural Insecticide, Fungicide leaders of U. S. hold two-day session at Westchester Club April 25 and 26.

WITH emphasis on the role of insecticides and fungicides in expanding the production of foodstuffs in the present world crisis, the mid-year meeting of the Agricultural Insecticide and Fungicide Association was held at the Westchester Country Club, Rye, N. Y. on April 25 and 26. Technical, economic and legislative angles of problems faced by the industry comprised most of the addresses and discussions at the meeting, the first full gathering of the AIF to be held in the post-war period. Among the Association committees, DDT, traffic problems, legislation, technical advances in insecticides, agricultural pest control progress, and legal problems were discussed in reports.

A welcome by AIF president, G. F. Leonard, vice-president of Tobacco By-Products and Chemical Co. opened the first day's meeting, followed by a report from Lea S. Hitchner, executive secretary of the Association. E. C. McClintic, chairman of the traffic committee reported on the findings of this group, following which the work of the Joint DDT Committee was reviewed by L. L. Hedgepeth of Pennsylvania Salt Manufacturing Co. and Sanford J. Hill of E. I. du Pont de Nemours & Company.

A leading law authority on the Robinson-Patman Act, Fair Trade Law and other trade practice legislation, George P. Lamb of Kittelle, Sawyer & Lamb, Washington, D. C. discussed various legal and legislative problems of the industry. The first day's session was closed with an address by Dr. Charles E. Palm, head of the Entomology Department of Cornell University, Ithaca, N. Y.

Dr. Alfred Weed of John Powell & Co. reported for the Technical Committee to open the convention's second day. Chairman of the AIF membership and information committee, Ernest Hart of Niagara Sprayer & Chemical Co., Inc. reported on the work of this committee, including a report from the information advisory committee. A resume of the legislative situation was given by Walter S. Gavan of American Cyanamid Co. C. Chester DuMond, Commissioner of Agriculture and Industry of Arkansas, as representative of the National Association of Commissioners, Secretaries and Directors of Agriculture, discussed insecticide laws and regulations of the States in relation to Federal legislation. A paper from the viewpoint of the southern agriculturalist was presented by Dr. Paul D. Sanders, editor of *The Southern Planter*.

Dealing with a subject vital to AIF members, S. A. Rohwer, assistant chief of the Bureau of Entomology and Plant Quarantine, U. S. Dept. of Agriculture of Washington, D. C. appeared as the final speaker on the two-day program, outlining the need for cooperation in agricultural pest control. He referred to the benefits demonstrated in recent years through

"coordinated, cooperative effort in combating certain insect pests of major importance" and to the legal and other procedures adopted by some states and communities in improving the final results through planned action. He spoke of advantages derived from immediately sharing research information, and pointed out the benefits secured in crop protection through use of current information on the status of insect pests.

Mr. Rohwer declared that "industry must recognize these new trends and continue to use and improve on practices followed during the war" to secure the greatest benefits. He stated further that the public is more critical of insecticides than formerly. "Claims made for new products will have to be supported by evidence acceptable to a public which is much more critical than the one which bought and used the present established insecticides," he warned. Performance will be measured in new terms of effectiveness, ease of application, and suitability for use in new devices as well as the effect their use may have on the operator, beneficial insects and livestock. In conclusion Mr. Rohwer reminded the meeting that the over-all job is too great for any one firm or agency to develop all the information required, to provide all the data needed and the answers to the numerous questions that must arise. Cooperation of investigators and a willingness of all to promote sound practices in pest control are the necessary factors in gaining success.

Dr. Alfred Weed, chairman of the AIF Association scientific committee reported on a program for training laboratory assistants for work involving insecticides, fungicides, etc. The project is to be conducted by the N. Y. State Institute of Agriculture, Farmingdale, L. I., and includes a revision of the school curriculum to give certain picked students training in chemistry, entomology and laboratory technique. The students will also visit laboratories in commercial plants to learn procedure, and will be trained as laboratory assistants in the field. They will be available later for employment by industry.

**Harold C. Davies**

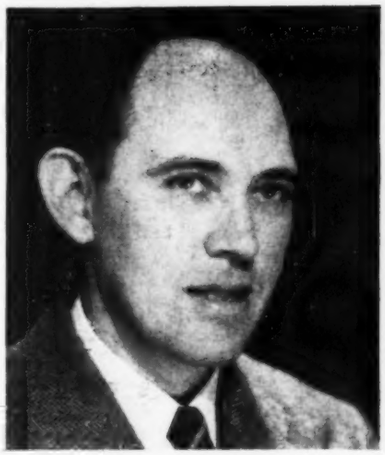
California Spray-Chemical Corporation, Vice-President of AIF Association

A NEW and complicated picture in the pest control industry is making imperative a program of dealer education, according to the general theme of Dr. Charles E. Palm who discussed this topic at the AIF meeting. He pointed out that in times past, a relatively few standard insecticides and fungicides were stocked by dealers who could do a fair job of supplying information for use of these materials. Today dealers are faced with a vast variety of new materials and a wide range of formulations of single materials, such as DDT. Furthermore, confusion and disagreements exist as to dosages, compatability, and proper use on certain pests. The dealer is pictured by Dr. Palm as being on the "front line" every day to give information to farmers, though often insecticides and fungicides are only a part of the materials on which he is expected to supply information. Teamwork be tween government and industry is helping the situation, particularly in the practice of sending technical service men into the field as follow-ups on pest control sales. Knowledge is further disseminated to users through the press, radio, and publications from industry and federal agencies.

Dr. Palm concluded that as dealer education becomes increasingly important it presents an opportunity for workers of government and industry to share the responsibility. The dealer's interest is largely that of business, whereas industry desires to see the grower receive quality materials of proved merit to give maximum pest control.

A plea for wider publicity to bridge the chasm between the relative ignorance of thousands of rural pest-control users and the broad knowledge held by crop experts and research leaders was made by P. D. Sanders, editor of *Southern Planter* "I think that meetings of this sort where business and professional men, and scientists, can sit down together and discuss mutual problems are the very essence of democracy," he said. "There must be an understanding, an appreciation by each group of the problems and ambitions of the other. Unless there is a free exchange of goods, services and ideals between the various groups . . . our form of government becomes faulty and our economic machine bogs down."

Mr. Sanders declared that spreading knowledge of one's wares through advertising or otherwise is indispensable in today's complex economy. He said that it was a poet, rather than a business man, who wrote of the world beating a path to the door of the unknown manufacturer who built in the woods a "better mousetrap." The world is too busy beating paths to competitive rodent killer manufacturers who advertise, Mr. Sanders observed. He continued by reminding his hearers that even though one develops the greatest insecticide of all time, he must tell the



**Dr. Charles E. Palm**

Head of Entomology Dept., Cornell U., Ithaca, N. Y., speaks on "Dealer Education"

world of the discovery or few will ever adopt it. A plea was also made for brevity in explaining scientific facts to laymen. "I have seen an entomologist utilize 500 words trying to explain the difference between a bug and a beetle only to succeed in the first paragraph in so befuddling the reader that he moved on to the next story," related Dr. Sanders.

George P. Lamb, Washington attorney and authority on the Robinson-Patman law, Fair Trade Act, discussed the Federal Trade Commission and delivered prices. He stated at the outset that there are four general systems of delivered prices: the single basing point system, multiple basing point system, zone pricing system and universal delivered prices. Legal cases on each of these systems were cited as illustrations. He pointed out that his discourse dealt only with FTC activities since the Justice department has not been active in this field during recent years. He stated that the FTC has had certain economic theories which it has advanced for many years, beginning with the Pittsburgh Plus case in 1924. The FTC desires all prices to be on an f.o.b. mill basis, he indicated, thus discarding all delivered price systems including the universal delivered price. FTC would like to outlaw universal delivered prices, but appears to be slightly doubtful as to the desirability of such a move, he said.★★

# AIF Meeting Program

**THURSDAY, APRIL 25, 1946**

| | |
|---|---|
| 9 A.M. | Registration |
| 10 A.M. | Opening Address by the President, Mr. George F. Leonard |
| 10:20 A.M. | Report of the Secretary and Treasurer, Mr. Lea S. Hitchner |
| 10:40 A.M. | Report of the Traffic Committee, Mr. E. C. McClintic, Chairman |
| 11 A.M. | Report of Joint DDT Committee Mr. L. L. Hedgepeth Mr. Sanford J. Hill |
| 11:30 A.M. | Address — "Robinson-Patman Act Developments and Recent Court Decisions on Basing Points" Mr. George P. Lamb of Kittelle, Sawyer & Lamb, Washington, D. C. |
| 12 M. | Address—"Dealer Education" Dr. Charles E. Palm, Head, Dept. of Entomology, Cornell University |
| 2 P.M. | Golf Tournament |
| 7 P.M. | Informal Dinner (Stag) Awarding of golf prizes by Mr. Joseph B. Cary, Toastmaster |

**FRIDAY, APRIL 26, 1946**

| | |
|---|---|
| 9:30 A.M. | Meeting called to order by Mr. G. F. Leonard, President |
| 10 A.M. | Report of the Technical Committee, Mr. Alfred Weed, Chairman |
| 10:15 A.M. | Report of the Membership and Information Committee, Mr. Ernest Hart, Chairman Information Advisory Committee, Messrs. G. M. Oehm, Chairman, W. S. Moreland, Glenn Campbell |
| 11 A.M. | Report of Legislative Committee Mr. W. S. Gavan, Chairman |
| 11:15 A.M. | Address—"Uniform State Legislation," C. Chester DuMond, N. Y. State Commissioner of Agriculture and Markets, member of National Association of Commissioners, Secretaries and Directors of Agriculture |
| 11:45 A.M. | Address — "The Pest Control Problem Is One of Promotion," Dr. Paul D. Sanders, Editor, The Southern Planter, Richmond, Va. |
| 12:15 P.M. | Address—"Washington Developments," Mr. A. S. Rohwer, Assistant Chief, Bureau of Entomology and Plant Quarantine, U.S.D.A. |

**MISCELLANEOUS INFORMATION**

Registration Fee—$7.50.
Golf Tournament Fee, $5.00, includes greens fees and prizes, but not caddies.

Golf Committee—Henry Wood, Chairman; R. B. Stoddard, William F. Hall.

# 2,4-D—Its Future In Weed Control

## An investigation of the market and patent situation in 2, 4-D... where does 2, 4-D fit into the weed control chemical picture?

WEED killers are "hot news" today in the nation's agricultural economy, faced as we are with the necessity of producing every available pound of foodstuff to relieve the world-wide post-war food shortage. And 2,4-D, the shortened popular contraction for 2,4-dichlorophenoxyacetic acid, is currently the hottest news in the weed killer market.

The product is new and unique in its method of action. It has already received widespread publicity in trade magazines and the daily press. Highly encouraging results are reported in its use, and finally, it is being produced and marketed against an interesting patent background, which, while it is confusing, has also aroused trade interest. This combination has been one to stir up controversy, not only among compounders and distributors of agricultural chemical specialties, but also among ultimate users and government officials. Reminiscent of the wave of publicity which followed the introduction of DDT several years ago, the general public appears willing and anxious to believe that this new weed killer, 2,4-D, will turn out to be a final cure-all for all weed problems.

And within certain limitations, these ideas may be well-founded, for as a weed-killer, 2,4-D has proved its efficacy in killing certain noxious plants while not harming the metabolism of their good neighbors, desirable grass or other valuable growths. This has brought about a flood of publicity to which the public is responding with the same enthusiasm and lack of complete understanding that characterized the early days of DDT sales.

While it is true that 2,4-D is opening up new avenues of approach to the weed problem, it should not be immediately assumed that it will at once supersede the many older time-tested methods of weed control which are still potent and effective. Such preparations as common salt, chlorates, iron sulfate, ammonium sulfate, carbon disulfide, ammonium sulfamate, sodium dinitroortho-cresylate, sodium arsenite, and oil will no doubt continue to be used in many applications. It is as yet far too early in the story of 2,4-D to state that it will or will not assume a predominant role in weed killing to the extent of eclipsing all of its older competitors. The ultimate judge will be the consuming public which sometimes takes years to reach a final decision. The industry would do well meanwhile to avoid the mistakes made so recently with DDT in its initial stages—thinking of it as a cure-all rather than just a very interesting new material, with a definite field of application all its own—and some drawbacks to accompany its many very evident superior qualities.

Interestingly enough, 2,4-D was first developed for the purpose of

stimulating plant growth as in horticultural application in spraying apple trees to promote thorough ripening of fruit. It had been noted, casually, that while concentrations up to 0.1 per cent were helpful to plants, in stronger proportions 2,4-D tended to halt growth. Users were admonished against applying over-doses. Patents for 2,4-Dichlorophenoxyacetic acid were first issued to John F. Lontz in June, 1943, and assigned to E. I. du Pont de Nemours Co. (Nos. 2,322,760 and 2,322,761).

These patents followed research from the standpoint of growth stimulation in plants without bringing into focus the possibility of making use of 2,4-D as a weed killer. Knowledge of these potentialities had been gained however through experimental work by the Bureau of Plant Industry at the Beltsville (Md.) research center of the U. S. Department of Agriculture. The initial experiments were carried out by Dr. Paul Marth and Dr. John W. Mitchell of the Beltsville station early in 1944. These investigations tested 2,4-D under a variety of greenhouse and laboratory conditions. During the summer the tests were extended to the field under the supervision of L. W. Kephart, senior agronomist in charge of weed control research in cooperation with state experiment stations throughout the middlewest and farwest. The bluegrass fields around the Beltsville station were subjects of extensive experiments and close touch was kept with similar investigations being carried on elsewhere.

IN the midst of this government weed-killing research, much of which was covered by a cloak of secrecy because of possible use of 2,4-D as a military weapon, an application was made at the U. S. Patent Office for rights to the use of 2,4-D as a weed killer. A patent was subsequently granted to Franklin D. Jones, assignor to American Chemical Paint Company, Ambler, Pa. Jones thereupon began production of 2,4-D under his patent No. 2,390,941, for explicit use of 2,4-D as a weed killer. On the premise that the previous Lontz patent disclaims use of 2,4-D as a weed killer, Jones maintains that the later patent is sound and unimpeachable. In the language of the Jones patent itself, the compounds "serve to promote plant growth, when used in very minute concentrations in the form of solutions or dusts, or in considerable higher concentrations in the form of pastes in such materials as fats or greases (e.g. lanolin). For the purpose of the present invention, the aforementioned compounds, whether or not they are plant hormones, must be used in much higher concentrations than have ever been used for plant growth promotion. The minimum effective concentration depends upon a number of factors such as, for instance the particular species of plant to be eradicated, the particular type of vehicle or medium, and whether or not an adjuvant is used. There is no upper limit to the concentration, except that dictated by economy . . ."

**File 2,4-D Patent Suit**

An important step toward clarifying the patent situation on 2,4-D was taken by Sherwin-Williams Company on March 16 when it entered suit against the American Chemical Paint Co., Ambler, Pa., asking that patents held by the latter be declared invalid and that American Chemical Paint Co. be enjoined from bringing or threatening to bring suit against the plaintiff. The case was filed in Federal Court, Wilmington, Del. This development indicates a desire on the part of Sherwin-Williams Co. to gain as soon as possible a court opinion on the validity of the patents covering 2,4-D held by Franklin D. Jones and assigned to American Chemical Paint Co. Both parties involved in the suit manufacture and market weed killer products containing 2,4-D.

As a herbicide, 2,4-D operates on a principle differing from earlier preparations, inasmuch as it penetrates into the conducting tissue of the plant, being carried deep into the roots to kill the plant throughout. Contrary to early popular ideas, the plants are not over-stimulated to cause death. Rather, when 2,4-D is applied on warm sunny days at which time plant metabolism is operating fully, the spray is absorbed readily to take the normal path from leaves to roots within the plant and destroy it from within. The dose disrupts the plant's chemical food-making processes and destroys its starch storage which causes certain starvation. The plant appears to die in "agony," being twisted by uneven growth of cells after the introduction of 2,4-D.

According to the Jones patent, the most advantageous and presently preferred method of use is to spray the composition on the leaves of the plant to be exterminated. This procedure uses to advantage the normal path taken by naturally-occurring hormones. The patent also points out the increased effectiveness of 2,4-D as compared to previously-used herbicides. It claims capability of "killing weeds, which are noxious, insidious and persistent like poison ivy in a period of two to three weeks. They (herbicides based on 2,4-D) can be applied to large areas at relatively small expense and have the added advantage that unlike prior herbicides they do not render the area sterile. Furthermore, they are not harmful to either man or beast, and can be readily handled without any danger."

A SITUATION which has somewhat confused the trade, however, results from the fact that other firms are manufacturing and selling 2,4-D in spite of the Jones patent. Approximately a dozen firms are manfacturing 2,4-D and a number of them have already done some rather extensive advertising of the new product, which has stimulated wide interest. It should be appreciated, incidentally, that the operations of these manufacturers, unless they sell their 2,4-D for use *as a weed killer*, are not in direct conflict with the Jones patent. This patent is a use patent, as distinct from a manufacturing patent. Any legal action by the patent holder would have to be against those who sell the finished consumer product for use as a weed killer. Manufacturers and sellers of the basic chemical might be guilty of contributory infringement if the patent is upheld by the courts, but not of direct infringement of the patent so long as they sell a chemical rather than a weed killer.

What is the actual marketer of

a weed killer to do under these circumstances? With most of his competitors offering a 2,4-D weed killer, and selling substantial amounts to a market that has expressed lively interest in the new product, he is very apt to feel that he does not want to miss his share of these attractive sales. But how protect himself from possible legal kickbacks?

The holder has announced that the patent will be defended vigorously against all infringers. When will the first test case be brought, and against whom? Will the patent be upheld or thrown out? Will this be another patent case that may drag through the courts for several years before a final decision is reached, carrying with it the threat of collection of substantial amounts of back royalties and penalties if the patent is eventually held valid?

At least one manufacturer of 2,4-D is advising repackagers who buy from them that they should, before putting their weed killer on the market, ask the patent holder for a license to operate under the patent. It is felt that the repackager's legal position will be definitely better if the Jones patent should be held valid, if he has at least requested such registration privilege, even though no registration has been granted. In any case, it is recommended that legal advice be sought and followed before selling a 2,4-D weed killer in the face of the Jones patent registration.

The patent holder, in a recent statement to *Agricultural Chemicals*, advises that they "intend to take all of the necessary legal steps to defend our patent rights against those who make any unlicensed use of 2,4-D." Incidentally, Mr. Jones also advises that two new patents in the weed killer field have recently been granted to him, and that several additional patents covering other phases of the subject are in prospect. The two latest patents are No. 2,394,916, issued February 12, 1946, and covering phenyl, napthyl and similar aryl alkyl acids as weed killers, and No. 2,396,513, issued March 12, 1946, covering napthoxy acetic acid and similar chemicals as weed killers.

In response to a direct query as to his company's licensing plans under the 2,4-D patents, Mr. Jones advised that to date no licenses had been granted. Negotiations are under way for the licensing of certain manufacturers, he revealed, but each application he indicated would be reviewed on its individual merits and no broad licensing program for the entire industry is ready for announcement at this time.

LOOKING further into the background of the 2,4-D story, a representative of *Agricultural Chemicals* interviewed Dr. Kephart of the Beltsville station of the Bureau of Plant Industry. He has been connected closely with the development of 2,4-D since the first work on the material as a weed killer. Likening the public interest in 2,4-D to the enthusiasm over DDT two years ago, Dr. Kephart pointed out that in contrast with the overenthusiastic and in many ways faulty DDT publicity, the 2,4-D situation is under better control. Manufacturers have refrained from the rather extreme claims which were common in DDT publicity and the public is partly educated to the fact that 2,4-D has limitations to be recognized.

Two sectional weed control groups representing the bulk of agricultural America met recently to establish standards of practice in the use of 2,4-D, and manufacturers have largely followed the lead of findings of these groups. The two bodies are the North Central States Weed Control Conference, and the Western States Weed Control Conference. The former held its meeting in St. Paul in November, 1945, and the latter met in Reno, Nev., in February, 1946.

The excitement over 2,4-D as a weed killer is not limited to agriculturalists in the United States, according to Dr. Kephart. Sugar cane raisers in Puerto Rico are reported to be enthusiastic over the new material, because of the promise it gives them of apparent victory over annual morning glory and nutgrass, neither of which has even been controlled before. These two weed pests have always been a major problem in cane growing and take a heavy economic toll each season. British scientists have likewise evolved a product similar to 2,4-D which due to wartime security was not announced until somewhat later. English experimenters were carrying on their own investigations at approximately the same time that scientists in the United States were working on the possibilities of 2,4-D.

In discussing the general work with 2,4-D, Dr. Kephart reviewed the agricultural picture regarding weeds, explaining that the worst offenders in weed growth are perennials whose roots form deep networks of far-reaching fibers almost impossible to reach with poison sprays. Bindweed for instance, has taken over thousands of acres of splendid agricultural land in certain western states and has resulted in abandonment of many farms. "Some entire counties are infested

(*Continued on Page* 63)

## 2,4-D Standard Practices Listed

AT its recent meeting in Reno, Nev., the Western States Weed Control Conference adopted the following rules of established practices for use of 2,4-D in weed control.

**For established lawns, pastures, grass seed fields, etc:**
**1½ pounds of parent acid in 100 to 200 gallons of water per acre.**
**For Annual weeds in corn grasses and cereals:**
**½ to ¾ pound in 100 gallons of water per acre.**
**For control of listed perennials (bindweed, dogbane) with exception of regrowth:**
**1½ to 3½ pounds of parent acid per acre in enough water to give uniform coverage.**

Rules differing somewhat from the above were adopted by the North Central States Weed Control Conference at their meeting in St. Paul.

# NEW ROTENONE AGREEMENT

**U. S. makes new contract with Peru at higher price . . . spot rotenone stocks continue short with new imports not likely to be ready for 1946 uses . . . end import purchases by CPA . . . long range outlook better.**

THE outlook for future rotenone supplies was clarified somewhat early this month by the announcement that a new purchase agreement has been negotiated with the Peruvian Government. Taking the place of the previous four-year agreement which expired on March 31, the new agreement will run for one year and will give Peruvian producers a substantially higher price for their root. Presumably the OPA will authorize an advance in price ceilings on rotenone insecticides to compensate for the higher cost of the essential ingredient.

Peruvian growers are to be guaranteed a price of 21 cents per pound for five per cent crude root, FOB Quitos, Peru, as compared with the 18 cent price which was the basis of the former inter-governmental agreement. As in the old agreement, shipments from West Coast ports will carry a one-half cent premium. Peru continues to guarantee that the country's entire exportable surplus will be made available to American buyers. The U. S. Reconstruction Finance Corporation will underwrite the program, but importation will be in the hands of private firms. Public purchase of rotenone roots by the U. S. Commercial Company has been terminated.

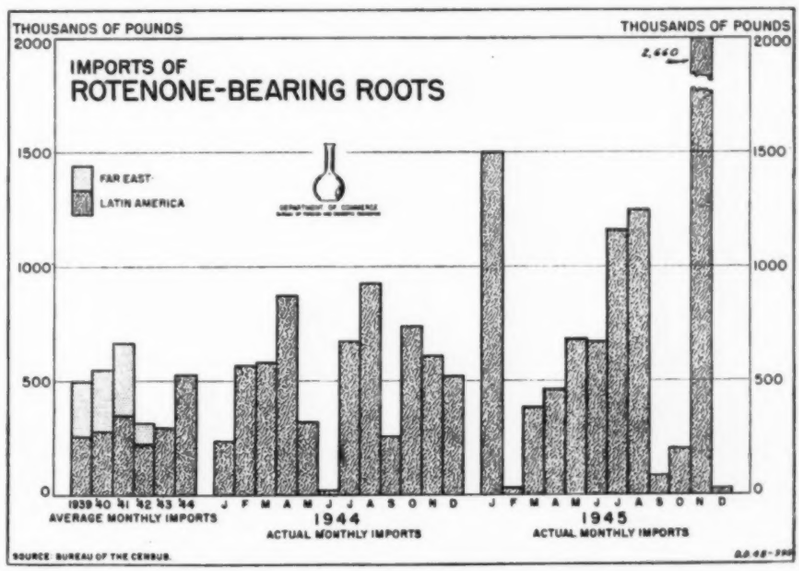
The successful negotiation of this new agreement clarifies the long-term outlook for rotenone supplies, but unfortunately for American manufacturers and users of agricultural insecticides, there is little that can now be done to help the 1946 supply position which is definitely bad. The country is faced with a serious shortage of rotenone insecticides over the next few months, a situation which promises to lead to serious crop losses during the coming growing season. Though imports of rotenone-bearing roots were large during 1945, available stocks have been largely dissipated and quantities of rotenone remaining in the hands of processors are reported to be very limited. Nor is there said to be any favorable prospect that the shortage will be remedied in the near future. Substantial arrivals cannot be expected from Peru before late May or early June, which will probably be too late for the material to be processed and the finished product distributed in time for use this season.

Responsibility for the current shortage has been laid at the door of the Civilian Production Administration by some in the importing and processing trade, because of CPA insistence on continuation too long of the public purchase program. Purchase of Peruvian rotenone root by the government, say some of these critics, should have been abandoned last fall, giving private importers a chance to make their own arrangements for the shipment here of available Peruvian stocks. Instead of terminating public purchase, however, at as early a date as many in the trade had hoped for, the CPA let the program run through until March 31. The current almost complete absence of rotenone supplies is the answer to failure of CPA to act earlier, say these observers.

The CPA has defended its position vigorously, pointing out that under the public purchase program, imports of rotenone bearing roots reached a record figure of almost nine million pounds in 1945, a figure well above those for pre-war years when we had ample supply sources in the Far East. Imports for 1945 are reported variously by two sources as either 8,820,000 or 8,770,000 lbs., comparing with 7,998,000 lbs. in 1941, 3,799,000 lbs. in 1942, 3,570,-

(*Continued on Page* 35)

Industry Report, Chemicals and Allied Products, March, 1946, U. S. Dept. of Commerce.



# DDT ITS ROLE IN AGRICULTURE

ANY effort to appraise the place a new toxic agent will have in the insecticide field involves a great deal of guesswork. When a material has been given such extravagant advance publicity as DDT has had, unusual uncertainties are introduced. Add to this the complications presented by numerous written and spoken statements with no foundation other than hearsay, or based on inadequate consideration and knowledge of available facts, and we have a ready explanation for the current confusion which seems to exist as to the future place of this interesting new material in the insecticide field. It seems doubtful whether any two people will have the same opinion, or whether anyone can be positive that his conclusions are correct. The following comments therefore must be considered as representing the current ideas of the writer and not the opinion of the agency to which he belongs. Workers with whom the author is associated, as well as others, have been consulted and their counsel and information considered.

Information on the insecticidal properties of DDT became available at a time when there was recognition of urgent need for better materials to control insects which transmit diseases to man and otherwise affect his comfort, efficiency, food and belongings. Intensive and extensive research rapidly developed several ways of using the new tool effectively. Companion studies determined the conditions under which its formulations could be safely applied to attain desired results. The facts developed were directly aplicable to similar and related problems of insect control under civilian conditions. When supplies of the chemical became available for general use, well-established information was on hand to guide those who could supervise the use of DDT insecticides in the control of many kinds of insects attacking and annoying man and causing losses in his household. The amount of the chemical that could be provided immediately for civilian uses was below the production capacity developed under war conditions. However, millions of pounds of technical DDT became immediately available for civilian use and was formulated into insecticides. In many cases those who produced the insecticides did not have adequate knowledge of their properties, limitations, and uses.

Experiments were begun early to appraise the value of DDT as a means of controlling agricultural insect pests. This field is far more extensive than the household field, and presents many more problems as to methods, means, and conditions of use. Tests promptly revealed that DDT was highly toxic to many pests of crops and livestock and that it could be applied in all of the types of formulations — solutions, emulsions, suspensions, dusts, and aerosols —used to apply agricultural insecticides. That it was selective in effectiveness and relatively non-toxic to quite a few highly important insect pests was also disclosed. More recent experimentation has confirmed the earlier work and pointed the need for much more research before answers can be given on where, when, and how DDT insecticides can be used in the agricultural field. If we were confused a year ago, and we were, we are better off only in degree with the results of another season's experiments available.

Notwithstanding this, a considerable proportion of the agricultural insecticides containing DDT that will be offered to the farmers during the coming crop season will be formulated, packaged, labeled, and sold without full benefit of results of the experimental work, which should provide the basis for sound recommendations for use. Even under most favorable conditions situations of this nature cannot be avoided because of the time required to produce and distribute material. The popular demand, real and imaginary, for DDT insecticides has contributed much to making the situation what it is. That it could be much worse is clear to those who may have some knowledge of what enthusiasts are doing. It is gratifying indeed that many in industry are taking a conservative attitude and advising others to do the same. The part of those responsible for the enforcement of the regulatory acts governing the marketing of insecticides, especially the constructive new procedure adopted by those handling

**By S. A. Rohwer** Bureau of Entomology and Plant Quarantine, U.S.D.A.

the Federal Insecticide Act, in regard to advising about labels and claims for use, should not be overlooked. They have rendered valuable service to the users and producers of insecticides.

Factors of fundamental significance in evaluating any insecticide are availability, cost, suitability for application, compatibility with other materials needed for pest control, immediate and final effectiveness, dependability, and the nature of the recommendations and advice of governmental officials and sales representatives of industry. A review of these factors should give a basis for appraising the position DDT insecticides will have during the coming season. The results of the 1946 season will contribute materially to appraisal of future trends, particularly as to uses in control of agricultural crop pests.

## Availability

IT IS difficult to construct any very satisfactory statement on the probable availability of DDT insecticides for use during the 1946 season. In response to requests, a number of manufacturers have supplied confidential information, in many cases in much detail, on the amount of the various formulations they have or expect to produce and market. These data provide a fairly satisfactory sample on which to estimate how the products of all insecticide manufacturers may be divided into four or five types of formulations—solutions, emulsions, suspensions, dusts and aerosols. Using such estimates percentage-wise and the total production of the chemical DDT since it was released from control, with due consideration for estimated amounts to fulfill government requirements and export, it has been possible to make some kind of a forecast of the quantity of various kinds of DDT insecticides that will be available for consumer use during the 1946 season. Appreciation is here given to the various companies who supplied data making these calculations possible.

It is estimated that during the seven-month period from September 1, 1945, to March 31, 1946, the production of technical and aerosol grades of DDT equalled 22,500,000 pounds. Of this amount it is estimated that 7,200,000 pounds was exported or sold to the government and others, and therefore is not available for the production of commercial insecticides for domestic use. The remaining 15,300,000 pounds of the chemical was or will be used to formulate insecticides available for consumer use, some of which were marketed the latter part of 1945. Using percentage estimates on how this 15,300,000 pounds has been or will be made into insecticides, the distribution between types is approximately as follows:

| | Pounds |
|---|---|
| Solutions | 5,000,000 |
| Emulsions | 700,000 |
| Dusts | 4,000,000 |
| Wettable powders | 5,300,000 |
| Aerosols | 200,000 |
| | 15,300,000 |

Production of DDT will apparently continue at the present rate of somewhat more than 3,000,000 pounds per month; so the quantity that will be used in the preparation of insecticides that may be applied during 1946 will be considerably greater than 15,300,000 pounds.

The foregoing figures give reasonable confirmation to conclusions already formed by many that the consuming public will have opportunity to secure DDT insecticides in large amounts in 1946. Information from many sources gives definite indication that supplies will be generally available through the country. How adequate they will be in relation to demand is difficult to state. The situation is confused. It is claimed by some that production is far short of demand. In other quarters there is considerable hesitancy toward producing large quantities of some formulations until the sales demand becomes more firm. There seems to be little, if any, let-up in the demand for technical DDT, and with this as an index it might be concluded that DDT insecticides will require an average annual production of technical DDT in excess of 30,000,000 pounds. Unless DDT insecticides find uses and procedures for carrying them out that are not now established, it is very questionable that such an amount will be used annually in the United States, even with extended use in cooperative control programs. In terms of finished insecticides this means a quantity far above any reasonable proportion of the total quantity of insecticides used

in the United States in an average year. Even for the current crop season it is uncertain that the consuming public will use the full quantity of DDT insecticides that will be available.

### Cost

AS TO selling price and the user's cost for DDT insecticides, there is so much confusion at present that any forecast as to what they may be in the future is highly speculative. Already consumer reaction has become somewhat critical because of the high prices charged for some of the hastily formulated products offered when wartime controls were released. This, the glamor supplied by news writers, the production facilities developed during the war, the uncertainties as to the types of formulations desired, and lack of information on how they should be produced have contributed in no small way to the present price war on DDT insecticides.

From the standpoint of the future use of DDT insecticides this is important and unfortunate. The competition to market products containing DDT has produced many formulations which have not been tested adequately. Claims as to their effectiveness and method of use are in many cases largely a matter of wishful thinking due to a belief that the killing and residual properties of DDT remain constant with all solvents, emulsifiers, carriers, and diluents, and that "know-how" is not an essential factor in formulation of DDT insecticides. Disappointments will follow such assumptions and contribute to adverse consumer reaction, especially when the consumer has been led to expect so much.

### Suitability and Compatibility

TO DATE research and performance tests have developed no chemical which competes with DDT in range of suitability for the preparation of all types of insecticides. Its compatibility with other chemicals used to control insect pests and plant diseases surpasses that of most other known toxicants to insects. It may be used in solutions, emulsions, suspensions, dusts, and aerosols. Its lasting property is an unusual feature. Its place in the scale of poisons injurious to man and other warm-blooded animals is at least as low and in many cases lower than many chemicals long used for the control of insect pests.

All these characteristics are highly desirable, but in this strength also lies a weakness of DDT because the desired results can be secured *only* if it is properly formulated and used. Exact directions as to use, and careful following of these directions are highly important. Past success of DDT insecticides has been based largely on this. The idea that if a little is good more is better should be combated, especially in some fields of use. Thresholds of effectiveness have not been determined, even experimentally, for many species of insects, and it is well established that over-dosages have caused disastrous effects when DDT insecticides have been applied to control certain pests. The persistence of DDT residues, however useful in the control of the insect pest, will be an important and perhaps the limiting factor in determining its value as an aid in controlling insects attacking food and forage crops.

**Optimum results with DDT insecticides can be secured only if the products are properly formulated and used, Mr. Rohwer warns, reminding agricultural insecticide manufacturers that "there is still much to be learned on how DDT insecticides will perform under various temperature, light and other climatic conditions."**

### Effectiveness and Dependability

IT IS generally recognized by those familiar with its use that DDT is a slow-acting poison even on insects most susceptible to it. From the standpoint of consumer use this is a weakness. Information in reference to its application should include appropriate mention of this together with a discussion of what the final results should be. As to the dependability of results the consuming public will get with DDT insecticides, there is but little basis on which to draw a conclusion, since DDT formulations have so far been available during the active insect season only for experimental purposes although sometimes this has been on a large scale. Extensive as the tests with DDT insecticides have been, it should be remembered that the tests in the agricultural field have been limited to little more than one, or in some cases two, seasons, that they have in some cases been carried on when insect populations have been below outbreak proportions, and that there is still much to be learned on how DDT insecticides will perform under various temperature, light, and other climatic conditions. For many possible uses, particularly those in the agricultural field, the dependability of DDT insecticides is far from being established country-wide even on an experimental basis.

### Recommendations for Use

RECOMMENDATIONS for use of a considerable number of the commercial DDT insecticides offered to the public this season go well beyond those which can be supported by sound experimental evidence.

Some overlook or ignore the possible effect the use of the product may have on factors other than the direct control of specific insect pests. This may have a far-reaching effect on the place DDT insecticides will have in the future. It is a factor which cannot now be appraised.

Examination of the recommendations, advice, and suggestions so far issued by governmental agencies on the use of DDT insecticides discloses wide variation and shows that considerable confusion exists. Any effort to summarize the recommendations and suggestions which have been issued would in all probability contribute to the confusion and inevitably reflect the personal attitude of the author. There is, however, more uniformity in recommendations as to use of DDT insecticides for the control of insects affecting man and of the various household pests. This may also apply to a considerable extent, to many of the uses directed to the control of pests of livestock. These are somewhat neglected fields of insect control and present an opportunity where much good can be accomplished by more extended application of insecticidal controls.

In the general, broad field of crop pest control, where the largest volume of insecticides has been used, the greatest differences occur in the recommendations and suggestions for the use of DDT insecticides. Results of analyses on residues on forage and other products, together with preliminary results on the absorption and retention of the chemical in body fats, secretions, and products, clearly point to the wisdom of awaiting more information before endorsement, direct or implied, of general or extensive use in these fields. Data on the possible effect of DDT on many forms of wildlife and beneficial insects still suggest the need for caution in general application and for technical direction and supervision wherever DDT insecticides are used over large areas. In brief, it is again emphasized that the use of DDT insecticides in the control of insect pests of crops is, with few exceptions, still in the experimental stage.

DDT in the various types of formulations will be available to consumers during the current insect season in large quantities. The amount may be more than adequate when consideration is given to lack of sound experimental evidence on which some of the uses are suggested.

The uses to which these materials may be put and the manner in which they are applied will have an important bearing on consumer reaction to the usefulness of DDT insecticides. Considering the differences in manufacture of the products that will be available and the variations in the recommendations and suggestions as to use, it is fair to assume that there will be wide differences in end results. This wide-scale commercial trial of DDT insecticides may have such profound effect on their possible future use that any statement on their place in the insecticidal field will be of little value. Be that as it may, on the evidence now available it appears reasonable to predict that DDT insecticides will fit into and affect the immediate insecticidal program in somewhat the manner enumerated below. Whatever the effect may be, it can be stated definitely that research programs and procedures that have been followed during the past few years in connection with investigations on DDT will have a profound effect on the future development of insecticides. New materials that may have promise will have to be studied by standards and in fields of inquiry that were not applied to many of the standard insecticides in advance of recommended use.

The following indicates how the author considers DDT insecticides will fit into and affect insecticidal uses in the immediate future:

1. They will be used extensively for the control of many different insects which attack man and reduce his efficiency and comfort through annoyance or by the transmission of disease. In these fields they will largely replace paris green, and supplement and through more extensive use of insecticides perhaps extend the use of more rapid acting materials, such as pyrethrum.
2. They will have wide use in the control of household insect pests, supplementing some of the insecticides now used for these purposes and curtail the use of certain insecticides and fumigants in this field.
3. They will greatly expand the use of insecticides for the control of house, stable, and similar flies, but will not eliminate and perhaps not markedly reduce the quantity of some of the well-established toxicants used for this purpose.
4. They will have an important place and extended use in controlling some insect pests of livestock. In this field the quantity of insecticides used has not been large, and such replacement of established materials as may occur will be of minor significance in the over-all insecticide field.
5. In the general field of forest and shade tree insect control they will have wide use, extending through cooperative control programs into fields where insecticides have rarely been used. For these purposes it may be expected that the current use of lead arsenate and cryolite will be curtailed but not replaced.
6. In the field of truck crop and vegetable insect control their greatest use will be as follows: (a) For combating insect pests of potatoes, impinging in appreciable percentage on the quantities of calcium arsenate, rotenone, and nicotine insecticides used for these purposes; (b) for control of bugs on sugar beets grown for seed, reducing but not eliminating the use of pyrethrum insecticides in this field; (c) for control of leaf-feeding insects on cabbage, lettuce, and some similar crops, replacing some of the lead arsenate, calcium arsenate, and cryolite used for these purposes. For other uses in this general field, including that of pea weevil and pea aphid control, the residue and other factors make the situation so uncertain that, notwithstanding industry recommendations, general acceptance for these uses is questionable.
7. For the control of certain cotton insects, such as bollworm, cotton flea hopper, and other sucking insects, they will complement and to a considerable extent replace current use of arsenicals and curtail the use of sulfur.
8. For the control of insects attacking various deciduous fruits

(*Continued on Page* 65)

Geigy
REG. U.S. PAT. OFF.

ORIGINATORS OF **DDT** INSECTICIDES

**ARE BUILDING SALES FOR DISTRIBUTORS AND DEALERS WITH A COMPLETE ADVERTISING-MERCHANDISING PROGRAM ON...**

# GESAROL and NEOCID COMPOSITIONS


- ***A Campaign of half-page 2-color ads in***
  **COUNTRY GENTLEMAN**
- ***Ads in 22 National and Sectional Publications read by***
  **POTATO GROWERS • TRUCK FARMERS • DAIRYMEN • CATTLEMEN ORCHARDISTS • HORTICULTURISTS**
- ***Colorful, hard-hitting Dealer Helps***
  **STREAMERS • COUNTER DISPLAYS FOLDERS • BOOKLETS**
- ***Local Newspaper and Radio Campaigns to publicize distributors activities in certain areas.***

*Remember!*

Geigy GESAROL* and NEOCID* compositions were first in the field.

They are backed by seven years of research and use.

Their performance is proven by extensive tests made by agricultural authorities.

Sell Geigy DDT compositions and you sell quality merchandise developed for specific uses.

Some good territories still open to Distributors.

Write or wire for further information and broadside on our sales campaign on Gesarol and Neocid DDT compositions.

* Reg. U.S. Pat. Off.

## GEIGY COMPANY, INC.

**89 BARCLAY STREET, NEW YORK 8, N.Y.**

ORIGINATORS **OF DDT INSECTICIDES**

# LIVESTOCK INSECT CONTROL

**By Dr. W. E. Dove** Insecticide Division, Dodge & Olcott, Inc.

AN entomological service to mankind is a subject that appeals to all of us. When such a service is for a livestock owner who suffers losses from insect pests, there is not only a genuine satisfaction in aiding the stockman, but there is also an added pleasure in protecting animals from insects and other parasites.

Until the last decade, the stockman did not seriously consider losses caused by annoyance of heel flies and the injuries resulting from heel flies or cattle grubs. He was inclined to view this pest as a necessary evil or to ignore it altogether. This lack of interest resulted in penalties of stockmen by cattle buyers for hides injured by cattle grubs, in failure of the animals to gain sufficiently in weight when fattened in feed lots, also in actual removal of some of the most valuable cuts of meat that were damaged by the presence of the grubs. It is estimated that the annual loss, based on pre-war prices, due to cattle grubs and heel flies was between 65 and 100 million dollars.

During the past few years when rotenone was not available in sufficient quantities for extensive use in control of cattle grubs, the Bureau of Entomology and Plant Quarantine of the United States Department of Agriculture demonstrated that this insecticide could be extended through the use of suitable diluents. The extenders having hard particles like pyrophyllite, tripoli earth, and frianite are intimately mixed with rotenone powder which makes it possible for more of the rotenone to come into contact with the cattle grub. When such insecticidal dusts are applied on the skin by hand at the proper time, the heavy particles easily penetrate the hair and enter the cysts containing the living grubs. A larger percentage of the grubs are killed in this way than by the treatments previously used.

Instead of using dusts containing 2½ per cent rotenone, insecticide manufacturers produce more efficient powder mixtures which contain only 1.66 per cent rotenone. This not only enables the stockman to treat more animals, but to kill a greater percentage of the cattle grubs. What started as a "stretching" process with a so-called "inert" material, resulted in an improved and a more efficient insecticide formulation. This is another example to remind us that no chemical is an insecticide until it is properly formulated.

At the present time when the use of good insecticides, the sound principles of animal husbandry, and efficient management in the handling

of animals are paying well for their costs, the stockman is more interested in further reducing the losses caused by insects. He is anxious to reduce his own losses, and he realizes that even greater savings are possible if neighbors also are induced to control their insect pests. This is resulting in cooperative pest control for greater efficiency. Such groups of stockmen need more information on the development of insects and upon the timely application of the most desirable insecticides.

To some extent the types of livestock insecticides can be grouped somewhat, even though the different external parasites show considerable variation in their life cycles and in their mode of injuring animals. From the standpoint of what the insects do to the host, they may be classified into kinds that visit animals and take blood, some that visit and lay eggs, some that feed upon the animal and also lay eggs on it, some that live upon the animals but drop to the ground for the purpose of laying eggs elsewhere, and some that do not eat or lay eggs upon the animals, but simply visit and annoy the animals.

### Blood Feeding Insects

THE immature stages of mosquitoes, horn flies, stable or "dog flies," deer flies, horse flies, sand flies, buffalo gnats, and other biting gnats visit animals for the purpose of getting a meal of blood. They develop in various kinds of media such as barnyard manures, fermenting wastes, wet soil, and in water of pools, swamps or streams. Many immature insect life stages in water and wet soil can be destroyed by proper drainage or by the use of an insecticide on the principal breeding places. Because it is impossible to obtain adequate control of the breeding places of any of them solely by the use of good cultural practices, safe efficient insecticides are needed for spraying the individual animals.

Since mosquitoes obtain blood principally from domestic animals and transmit dengue fever, encephalomyelitis, and malaria to man, human bots to man and animals in South America, and are responsible for filarial infections of man and animals, there is a very strong demand for controlling them in order to prevent the spread of important blood borne diseases. Fortunately much is being accomplished in this direction by health authorities and others, and the public is becoming more insistent on adequate control of all kinds of mosquitoes. This interest in health will also accomplish some protection of livestock from mosquitoes.

Horn flies feed almost entirely upon cattle and develop from eggs that are laid in cattle droppings in pastures and on the range. These flies are not known to transmit any diseases to cattle and since they seldom bite man or other animals, they are not regarded as possible vectors of disease of other animals. As many as four to five thousand horn flies often live on a single bovine. When such a fly population is present it necessarily robs the animal of a large amount of its blood, energy and food. Undoubtedly such numbers weaken animals and cause many of them to become more susceptible to diseases and parasites. Efficient sprays that are safe for use on animals are becoming more popular with the owners of livestock, and surface sprays applied to portions of range animals are extremely promising for control of this pest.

Stable or "dog flies" breed in manures mixed with fermenting substances or in waste feeds. These insects are noted for their severe bites on man and animals. They look like house flies but, unlike the latter, they are capable of piercing the skin for meals of blood. The larvae are not easily killed by insecticides, and it is difficult to treat the breeding places without adversely affecting the fertilizer value of manures. Surface sprays on locations where the flies rest, and the use of repellents on the animals are indicated for control of this pest.

Horse flies and sand flies develop in soil that is saturated with moisture, and the larvae feed upon animal matter. Some of the biting gnats breed only in soil that is saturated with salt water and are commonly found about the edges of salt marshes. Related species breed in rot holes of trees. These biting midges are often so small that one feels the bites before he observes the gnat. Surface sprays and repellents are very promising in protecting animals.

On account of the variety and extent of the breeding places of the insects that visit animals for the purpose of obtaining meals of blood, it is necessary to spray the animals in order to protect them. For such protection certain surface sprays effective for killing the insects for several days and some fly repellents are effective in keeping flies off the animals for one-half to two days.

ALL species of ticks and fleas depend upon the blood of animals for their existence, and when they are ready to lay eggs they drop from the animal and conceal themselves near the surface of the soil. Fleas that drop from domestic animals lay their eggs in localized resting places of the animals or upon the bedding of the animals. In residences they may deposit eggs upon the floors or rugs. Insecticides should be used on the animals for the adult fleas and upon floors, rugs and bedding of animals for destruction of the immature stages of fleas, otherwise the untreated breeding places will continue to reinfest the animals.

Photo (opposite page) shows process of screening out internal parasites of animals through a sieve containing three differently meshed screens which catch various sizes of parasites. Work done at Dodge & Olcott Entomological Development Laboratory at Baltimore, Md. Photo courtesy Dodge & Olcott.

Ticks gorge themselves with blood and drop from the animals over such wide areas and under such different conditions, that it is not practicable to attack the stages that occur off the animal with insecticides, although lots, kennels, parks, camping grounds and public play places may be sprayed or dusted to advantage. Dips are desirable for the treatment of the infested animals and are widely used, but sprays and dusts can be applied to the animals to kill ticks that are already attached or to repel other ticks for periods of a few days.

Two species of ticks attach themselves to the ears of domestic animals and produce injuries that often become infested with screwworms. For control of these ticks an insecticide is incorporated into a suitable smear and is applied to the ears. A single treatment should be effective for a couple of months, so that it can be applied when the animals are rounded up for other purposes.

### Lay Eggs Upon Animals

SEVERAL very important flies visit and lay eggs upon animals. The heel flies of cattle which are the parents of cattle grubs, bot flies of horses, nostril flies of sheep and goats, wool maggot flies, and screwworms behave in this manner. Each of them is responsible for substantial losses to the owner of livestock. So far, the most satisfactory method of control of these pests is the use of a treatment to kill the larval stages. Cattle grubs are killed with dusts, sprays or dips containing rotenone, and no other known insecticide is as efficient for this pest. Horse bots are usually treated by a competent veterinarian who is skilled in the administration of carbon bisulfide in capsules, and who can cope with any emergency that may arise after treatment. Sheep and goats are not easily treated for nostril grubs, but some recent work suggests that certain treatments may be of value. More efficient larvicides that are safe for use on animals are needed for treatment of animals infested with nostril grubs.

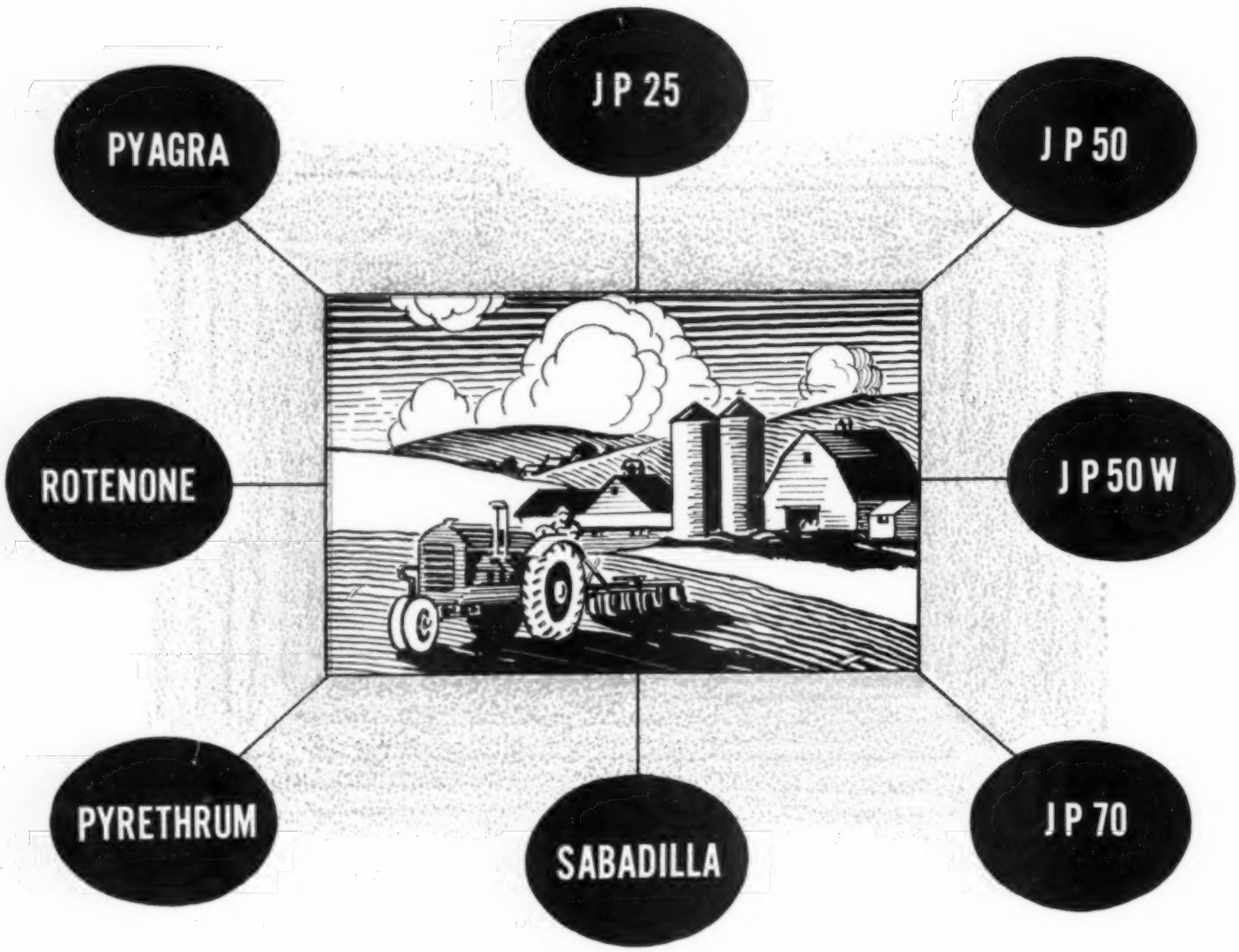
Some species of blow flies deposit eggs on soiled wool on living animals, and in many cases the developing larvae actually devour portions of the weak animals and cause them to die. These flies ordinarily develop in very large numbers in carcasses of animals or in other decaying animal matter so that they are always present in numbers sufficient to infest readily a neglected sheep. It is not practicable to use sprays to reduce the adult fly population, but it is advisable for the owner to treat the infested animals in order to kill the larvae present. Emulsions that are not harmful to the animal may be used to treat the hair for killing the larvae. The use of a good fly repellent on animals that are subject to attack of the flies will also prevent flies from depositing eggs for a few days.

Screwworm flies lay their eggs only on the wounds and injuries of living animals. If they are about two-thirds grown at the time of death of an animal, they will complete their development and produce flies. The screwworm flies will not lay eggs on carcasses of animals or upon decaying meats. They deposit eggs upon navels of calves and on other vital areas, and in these locations they can cause death of the animal within a week or two. This pest normally takes an annual toll of about five million dollars. When it is able to become established in localities where people are not familiar with it, it can develop into outbreak proportions and cause some heavy losses. During an outbreak of this kind in the Southeastern United States during 1935, it was estimated that 17.95 per cent of all domestic animals in Georgia became infested. Of this number 14.73 per cent died of the infestations or from mistreatment of the infested wounds. Outbreaks may be expected in northern areas, if screwworms are imported in shipments of animals early in the season. An outbreak in Illinois in 1935 resulted in 3,805 cases and 311 deaths among domestic animals.

Stockmen familiar with the pest will watch for early infestations of animals, and will treat them promptly. This not only benefits the animal treated, but helps to avoid a build-up of this pest. The treatment is made with an insecticide that can be used safely on wounds and one that will kill the screwworms. The type of treatment should not include a repellent, but it should have a toxicant that will kill the screwworm and the adult flies that visit the wounds.

Four kinds of parasites remain on the animal during their entire existence and lay eggs on the animal for the next generation. The sucking lice feeding upon the blood of ani-

*(Continued on Page 63)*




# FARM SCENE - POWCO BRAND STYLE

REG U.S. PAT. OFF.

*JP 25*—A 25% water-emulsifiable DDT Concentrate. *Uses:* Animal sprays and dips, barn and dairy sprays.

*JP 50*—A 50% DDT dust concentrate; small particle size, conditioned. *Uses:* Agricultural dusts.

*JP 50W*—A 50% DDT wettable dust concentrate; small particle size, conditioned. *Uses*: Agricultural sprays, animal sprays and dips, dairy and barn sprays.

*JP 70*—A water-emulsifiable concentrate containing 70% of DDT isomers. *Uses:* Especially adapted for potato insects.

*Pyagra*—A water-emulsifiable pyrethrum plant spray concentrate. *Uses:* Agricultural spray; insect control on ornamentals and greenhouse crops.

*Sabadilla* — A 50% dust concentrate of activated sabadilla seed. *Uses:* Agricultural dusts and cattle louse powders.

*Stimtox "A"*—A stable, impregnated pyrethrum powder. *Uses:* Agricultural dusts and spray powders.

*Rotenone*—A time-tested, safe, efficient, high-quality, standardized powder. *Uses:* Agricultural dusts and spray powders.

Basic materials for insecticide manufacturers

## JOHN POWELL AND CO., INC.

ONE PARK AVENUE NEW YORK 16, N. Y.

*Specialists in agricultural insecticides for 25 years*

POWCO BRAND

REG U.S. PAT. OFF.

**"KILLING POWER—that's the thing!"**

# Insecticide Legislation —A Long Term Plan

**Agricultural economic poisons governed by hundreds of conflicting laws and regulations . . . long-range program for co-ordinated legislation suggested**

**By Lea S. Hitchner**
*Executive Secretary*
*Agricultural Insecticide & Fungicide Association*

THE agricultural economic poison industry at the present time is regulated in various degrees by a great number of laws and regulations. A survey made at the end of the 1945 legislative season showed:

33 insecticide and fungicide laws
48 pharmacy laws affecting sales
35 poison laws affecting sales
48 states with label requirements
39 laws which permit alternate labeling
9 laws which do not permit alternate labeling
24 laws with unbroken package provisions
21 laws requiring registration
17 laws requiring registration fee for each item or brand
11 states requiring coloration of poisonous insecticides

In addition there are approximately 100 regulations issued under the various laws to which the industry is subjected. Many of these laws and regulations are conflicting.

The industry is regulated not only by the insecticide and fungicide laws, but by over-lapping provisions of pharmacy laws, poison laws, animal remedy laws, and pure food and drug laws. City ordinances further complicate the problem. In addition to the state legislation above referred to, there are the Federal Insecticide Act, the Federal Caustic Poison Act, Federal Trade Commission Act, and others. Many of these laws have been passed over a period of years without consideration of a definite over-all pattern and, in general, with no full recognition of the economic problems involved.

They place a severe burden on efficient production and distribution of the products of the industry, yet in many cases they still fail to protect the agricultural users and the public as was intended when the laws were passed.

To comply with all of these various laws, each company is burdened with expensive clerical work to meet such requirements as registration, submission of labels, directions for use, and preparation of special labels. Lack of uniformity creates volumes of clerical work. The cost, including fees, to one company doing business throughout the United States is over $12,000 a year. Special labels to meet special requirements in some states mean not only the cost of special labels, and in many cases special containers, but duplication of inventories and therefore high-cost of distribution. Special stickers must be attached to all containers going into some states. In others, stamps must be affixed. These again involve additional costs and retard the normal flow of the products from the manufacturer to the consumer. In some cases manufacturers, because of high fees and special requirements, have refused to ship into some of the states.

### DDT Traffic Complicated

During the last year an extraordinary legislative situation, which further complicated the overall picture, was caused by the release of DDT for civilian use. This chemical was subject to a great number of special regulations by the Federal Government and various state agencies. In many cases, the regulations and laws were conflicting and the distribution of this material was seriously threatened. It was necessary for the industry, through a committee, to make representations in 11

states and Hawaii, and to send representatives to several states in order that the laws and regulations would follow the Federal pattern and permit distribution of the product.

This work was of particular importance because a legislative pattern was thus being established for many of the new organic chemicals which will be used by the industry and agriculture. In the case of DDT, regulations and laws, unfortunately, originated from different state agencies which caused further confusion.

The industry is faced with a further increase of restrictive legislation of this kind unless a constructive program of simplification and unification is promptly put into effect. The agricultural insecticide and fungicide industry is and has been in favor of constructive regulation covering the sale of agricultural economic poisons. This fact is recognized by Federal and State enforcement agencies.

It is recognized, however, that the passage of further legislation, unless on a definite and constructive pattern, can only be a further handicap to the industry and to the public. In support of such a program, the industry at a meeting of the AIFA in April, 1944 unanimously went on record as offering to cooperate with the Federal Government in modernizing the Federal Insecticide Act of 1910. A few months later a similar program of cooperation was adopted for supplementary state and other types of legislation.

### Research by Committee

A legislative committee of the industry was requested to develop a program covering legislative policy. During the last two years, a great amount of work has been done and the fundamental program has been adopted. This program provided first for bringing up-to-date the Federal Insecticide Act of 1910 to meet modern technicological and economic developments. Second, a long-range program of supplementary state legislation following the general pattern of the modernized Federal Insecticide Act, but modified to meet state conditions is to be proposed. The regulation of all economic poisons is to be centralized under the insecticide and fungicide law of the Federal government and the insecticide and fungicide laws in the various states, and administered by the Federal and State Departments of Agriculture. The agricultural agencies are the best informed on entomological and pathological uses of insecticides and fungicides. Under this program there should be a gradual reduction in laws affecting the industry. Control by agencies other than those administering the insecticide and fungicide laws would be eliminated.

### Seed Program Successful

An outstanding example of a similar successful program is that in the seed industry. Today there is the Federal Seed Act of 1939 which has been adopted as a pattern for state laws in nearly all of the 48 states. Other examples can be given.

Such a program is one which should have the support not only of manufacturers but distributors, dealers and users. Such a program will provide greater protection to users and the public, and would simplify compliance and reduce the restraints on distribution.

### A Modernized Federal Act

IT HAS long been recognized by both industry and government that the Federal Insecticide Act of 1910 needed to be brought up-to-date to meet modern technicological and economic progress. Many of the standards in the Act of 1910 are obsolete. The law contained no provisions requiring the word "poison" or other adequate warnings on hazardous materials. There is no provision which permitted the enforcement authorities to check quickly the sale of adulterated or misbranded materials. Many other weaknesses could be cited. One of the causes for the wave of well-intended but faulty state legislation was the inherent weakness of the Federal Act. It was common knowledge that various Federal agencies had considered for some time revisions of the Act of 1910 and that drafts were being prepared.

Discussions were held among representatives of the agricultural insecticide and fungicide industry and the government agencies. Through the efforts of C. W. Kitchen, then the chief of Agricultural Marketing Service, U. S. Department of Agriculture, and Harry Reed, Chief, Livestock & Meats Branch, Office of Agricultural Marketing Service, U. S. Department of Agriculture, arrangements were made for Government-Industry discussions. Mr. Reed first presented to industry the Government's ideas of what the new law should contain and requested the criticisms and suggestions of industry in drafting a workable law.

Representatives of industry met with the enforcement officials. S. R. Newell, W. G. Reed and Dr. E. L. Griffin cooperated in every possible way, and as a result of several conferences, H. R. No. 4851 was introduced by Congressman John W. Flannagan (D.-Va.) in the 79th Congress, and referred to the Committee on Agriculture for consideration. This bill contained many of the recommendations of industry representatives. There were, however, several features of the bill to which industry still had objections.

During the hearings on H. R. No. 4851 the AIF Association presented 29 recommendations covering modifications of the bill. These were covered in a brief which was distributed to all members of the Association and to members of the House Committee on Agriculture. The brief included nine interpretations received from the Production & Marketing Administration, which are to be incorporated in the Congressional Record.

Sixteen of the other recommendations were accepted in principle by the committee, although the wording may differ from the specific industry recommendations. In two cases, industry recommendations were withdrawn. All of these changes were incorporated in H. R. No. 5645 which has replaced the original H. R. No. 4851.

The preparation of this bill represents a forward step in cooperative effort between industry and government in the development of workable legislation.

The success of any legislation of this type depends on competent and effective administration. Regulations which will be written by the administrator of the act are in many cases more important than the act itself. They have the full force of law and cover the detailed operations thereunder. The industry has been advised that it is the announced purpose of the administrative officials to consult with industry in the preparation and issuing of regulations to carry out the purposes of the act. The Agricultural Insecticide and Fungicide Industry welcomes this opportunity.

It should be recognized that any legislation of this kind must represent a compromise between the views of enforcement officials, industry and agriculture. As in every major piece of legislation differences of opinion are inevitable. No such bill is ever perfect.

Leading farm organizations, as well as the agricultural insecticide and fungicide industry, however, as shown by testimony of the public hearings, believe that this bill is a practical and workable regulatory act which can serve as the pattern for supplementary uniform state legislation.

### A Long-Range Program

THE National Association of Commissioners, Secretaries and Directors of Agriculture is mutually interested with industry in a new federal insecticide act and has expressed itself as anxious to see "that state regulatory bodies are in a position whereby the state authorities now in the field can take care of enforcement at state levels."

That association is fully aware of the conflicts of present legislation and has indicated its interest in cooperating with the industry in the preparation of a model state act, patterned after the federal act, which can be passed by the various state legislatures. Furthermore, that association in cooperation with the Council of State Governments and the Division of Federal State Relations of the Department of Justice, has proposed to draft a state bill and the Council of State Governments will sponsor the enactment of this uniform legislation in the various states. Here is a program of supplementary and uniform state legislation to be patterned after federal legislation which can be used for a long-range program in solving legislative problems.

Another step toward legislative simplification and orderly marketing is the creation of an association of state enforcement officials. Representatives of such an association could meet with representatives of industry and further simplify and standardize regulations which are as important as the laws themselves. Standardization of regulations and interpretations through such procedure could complete a pattern of simplification and standardization of the laws and regulations. The only alternative to this program is an increasing number of conflicting laws and regulations, and increasing burdens to the industry and agriculture. New legislation cannot be prevented. It can be guided.

The primary objective of the act is better protection to the users of agricultural insecticides and fungicides and to the public. This bill will greatly extend such protection.

## GUEST EDITORIAL

(*Continued from Page* 16)

of all who can contribute to its advancement. It is with this thought that we of the industry have welcomed the opportunity to cooperate with our friends in the Department of Agriculture, in the State Colleges and Experiment Stations, and with the county agents. We have welcomed, also, the opportunity to cooperate with the press and radio in disseminating industry information bearing on agricultural pest control.

This brief message, written in behalf of the Agricultural Insecticide and Fungicide Association, would not be complete without a reference to *Agricultural Chemicals*. We of industry can take special satisfaction in the decision of the publishers to launch this new publication. We welcome it not alone as a journal which will carry news and information of our industry, among others concerned with chemicals. We welcome *Agricultural Chemicals*, also, as a journal which will become an increasingly valuable educational influence in advancement of agricultural pest control.

## ROTENONE SHORTAGE

(*Continued from Page* 23)

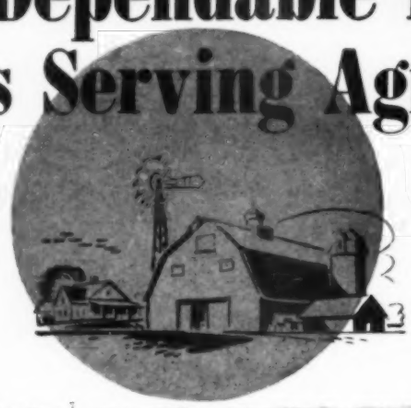
000 lbs. in 1943 and 6,327,000 lbs. in 1944.

On the basis of the above import figures, the CPA might logically feel that it has done an acceptable job through the public purchase program in finding new sources to replace production areas lost early in the Pacific war to the Japanese. They are thought to have been anxious, too, to avoid in the case of rotenone, a repetition of the chaotic market situation which followed removal of controls on other materials of foreign origin such as carnauba wax.

Whatever their feeling, it has been evident for some time that importers and processors were anxious to put an end to the public purchase program, and to take their own chances once more in a free market. The Industry Advisory Committee, named a few weeks ago by the CPA, recommended last month that public purchase be terminated promptly, and this action has now been taken.

Another factor in the rotenone supply picture, which may mean much more six months from now than it does today, is the eventual resumption of shipments from the Far East, our most important pre-war source for rotenone-bearing roots. Some root has already left Malaya, but it was destined for England, not the United States. Small shipments of root are also reported to have been made to the United States from the Philippines although no confirmation is as yet obtainable on this point. Inside of six months, however, numerous observers indicate that fairly sizeable arrivals may be expected from Java and Sumatra. Unfortunately, it will be late this year, or early in 1947, before much relief can be looked for from this direction.

# Standardized Dependable Rohm & Haas Products Serving Agriculture



**COPPER OXYCHLORIDE:** a copper compound particularly adapted for dust formulas for home gardens.

**CUPRO-K** fungicide for use in sprays and dusts to control cherry leaf spot and other fruit diseases. Also recommended for Bordeaux-sensitive vegetables such as cucumbers, muskmelons and tomatoes.

**25% DDT EMULSION CONCENTRATE:** for dilution in water for use as residual action sprays, animal sprays and dips, and crop sprays.

**D-30 SOLUTION:** a 30% DDT concentrate for use in fly sprays and residual-action sprays.

**DDT TECHNICAL GRADE:** has setting point of 89°C min. For use in all types of DDT insecticides.

**D-50 DUST:** 50% DDT concentrate for use in agricultural dusts and powder insecticides.

**D-50 WETTABLE POWDER:** a 50% DDT water-dispersible powder for use in agricultural, livestock, and residual action sprays.

**DITHANE D-14:** water soluble thiocarbamate fungicide, used in combination with lime and zinc sulfate for control of early and late blight on potatoes, tomatoes and celery, blue mold on cabbage, and certain other diseases of truck crops and ornamentals.

**HYAMINE 1622:** quaternary ammonium salt for use in products for disinfection and sanitation of dairy equipment. Also recommended for veterinary disinfectants and other specialty uses.

**HYAMINE 3258:** water-soluble quaternary ammonium pentachlorophenate, combining the anti-fungal properties of the quaternary ammonium salts with those of the chlorophenates. Recommended as a mildew-proofing agent for leather and fabrics, general household use and food storage.

**LETHANE B-71:** organic thiocyanate powder insecticide concentrate for use in agricultural dusts, flea and louse powders, and related products.

**TOXICANTS FOR CROP INSECTICIDES**

LETHANE 60 — LETHANE B-72
D-50 DUST
DDT TECHNICAL GRADE
LETHANE A-70 — LETHANE B-71
25% DDT EMULSION CONCENTRATE
D-50 WETTABLE POWDER

**TOXICANTS FOR BARN AND LIVESTOCK INSECTICIDES**

LETHANE 384 — LETHANE B-71
D-50 WETTABLE POWDER
D-50 DUST
LETHANE 384 SPECIAL
D-30 SOLUTION
25% DDT EMULSION CONCENTRATE

**FUNGICIDES**

DITHANE D-14 — YELLOW CUPROCIDE
CUPRO-K — COPPER OXYCHLORIDE

**EMULSIFIERS, SPREADING AND WETTING AGENTS**

TRITON B-1956 — TRITON X-100
TRITON X-45 — TRITON X-155
TRITON X-166

**DISINFECTANT AND MILDEW-PROOFING CONCENTRATES**

HYAMINE 1622 — HYAMINE 3258

**LETHANE B-72:** organic thiocyanate powder insecticide for use in spray applications in control of aphids, thrips and certain other sucking insects.

**LETHANE 60:** organic thiocyanate liquid insecticide concentrate for agricultural dusts and sprays, especially in combination with pyrethrum and rotenone and other specialized insecticide formulas.

**LETHANE 384:** organic thiocyanate liquid insecticide concentrate for use in household and livestock sprays, aerosols, and related products—noted particularly for fast action, repellency, stability, uniformity and economy.

**LETHANE 384 SPECIAL:** an organic thiocyanate liquid insecticide concentrate for use in household insecticides—recognized for its fast action, stability, uniformity, mild odor, and economy.

**TRITON B-1956:** phthalic glycerol alkyd resin for use as emulsifying agent in oil-base mosquito larvicides, dormant sprays, summer oil-sprays for fruit, and as a spreader and depositing agent for use with fruit and vegetable sprays.

**TRITON X-45:** alkylated aryl polyether alcohol; an emulsifier and detergent, more soluble in oil and less soluble in water than Triton X-100. It is less expensive than Triton X-100 and is suggested for oil sprays in agriculture.

**TRITON X-100:** alkylated aryl polyether alcohol for use as an emulsifier for DDT solutions, plant-spray formulations, and other insecticidal compositions.

**TRITON X-166:** dry emulsifying, wetting and dispersing agent for use in the manufacture of wettable sulfur and other dry insecticides and fungicides to be used as suspensions — suggested for household scouring powders.

**TRITON X-155:** alkyl-phenoxy polyethoxy-ethanol for use as an emulsifier in solvent solutions of Rhothane or DDT, plant sprays and other insecticide formulations.

**YELLOW CUPROCIDE:** electrolytic copper oxide fungicide for use in agricultural sprays and dusts and as a seed treatment.



Branch offices: Chicago, Kansas City, Los Angeles, Oakland . Canadian Distributor: P. N. Soden & Co., Ltd., Montreal and Toronto.

## ROHM & HAAS COMPANY

*WASHINGTON SQUARE, PHILADELPHIA 5, PA.*

Manufacturers of Chemicals including Synthetic Insecticides . . . Fungicides . . . Plastics . . . Enzymes . . . Chemicals for the Leather, Textile and other Industries

**By H. F. Wilson**
Dept. of Economic Entomology
University of Wisconsin

IN field applications of insecticidal and fungicidal dusts using mineral dispersants, it has been observed that all dusts cause more or less abrasion on fan blades and dust outlet tubes. It is also noted that the abrasion factor is much more serious with some dusts than with others.

Because of their low cost, materials which might be considered for dispersant purposes are quartz, magnesite, dolomite, serpentine, calcite, steatite, "Pyrax,"* a variety of talcs, and certain types of mica. But because of mineral hardness some of these materials could be expected to cause serious abrasion problems which would greatly inhibit their use. An examination of the mineral hardness of these materials shows that when relatively free of impurities they fall into the following arrangement:

| *Mineral* | *Hardness* |
|---|---|
| Quartz | 7.0 |
| Magnesite | 3.5-4.5 |
| Dolomite | 3.5-4.0 |
| Serpentine | 2.5-4.0 |
| Calcite | 3.0 |
| Steatite (talc) | 1.5-2.5 |
| Pyrophyllite (Pyrax) | 1.0-2.0 |
| Talc | 1.0-1.5 |

All of these materials except magnesite, dolomite, and serpentine were tested in a small sand blast machine and were found to follow in the same order when the sample was of approximately the same average particle size.

Specific data is not given because it was found that samples of the same mineral varied greatly in the degree of abrasion. When impurities were present, they affected the abrasion factor and the degree of abrasion was directly related to mineral composition. It was also found that the degree of abrasion was directly affected by particle size. When coarse sand was compared with fine sand, the abrasion factor was three times greater for the coarse than for the fine sand. When two identical samples of steatite having a reported 200 and 325-mesh screen size were compared, the coarse sample was approximately three times as abrasive as the fine sample.

Pure pyrophyllite was not obtainable in sufficient quantity to make a test, but half a dozen samples of "Pyrax" were compared and each one gave a slightly different result. This was attributed not only to variation in average particle size but to differences in mineral composition. A mineralogical analysis of "Pyrax" shows it to contain variable amounts of pyrophyllite, quartz, and mica. Free quartz crystals in varying amounts and of different particle sizes could easily account for variation in the abrasion factor.

When one sample of "Pyrax" having a maximum particle size of 40 microns was ground to have a maximum particle size of 10 microns, the reground material was found to be three to four times less abrasive than the original. When four different talcs were compared, three were found to be less abrasive than "Pyrax" and one was comparable.

To get a satisfactory comparison of the different talcs available in the United States it would be necessary to use a large number of samples from each deposit with a determined mineral composition and average particle size for each. Talc samples which we have been able to study from the different commercial deposits in the United States show that nearly all contain impurities in the form of ferrous or ferric iron and that sometimes free quartz, serpentine or steatite crystals may be present which might directly affect the abrasion factor. Some talcs also break down into very fine or colloidal particles when ground to pass a 325-mesh screen which results in a very low abrasion factor.

Clay samples of different origin are generally not highly abrasive but this again depends upon mineral composition and particle shape as well as size. In some clays the particles tend to be nearly round (non-abrasive) while others have large numbers of irregular shaped particles which under the microscope appear to be free quartz crystals (abrasive).

For some reason not yet determined, rotenone dusts made with pure quartz have given the most consistent high control of the pea aphid in the greenhouse. "Pyrax" and calcium carbonate were next in order and steatite proved better than any of the talcs. Thus it seems that those materials that are most abrasive are the most efficient in dispersing rotenone.

In connection with continued used of rotenone as an insecticide, it will be necessary to use abrasive materials for dispersants to obtain the most effective control possible. If rotenone should be largely replaced by new synthetic compounds, however, it may be found that the less abrasive materials will be entirely satisfactory.

* A product of R. T. Vanderbilt Co., New York.

# 5 POUND AEROSOL BOMB !

*Refillable—Economical*

# MUL-T-VAPOR

Dept. of Agriculture Patent No. 2,321,023

Capacity 750,000 to 1,250,000 Cubic Feet

Can be had with or without DDT

| WITH 3% DDT | WITHOUT DDT |
|---|---|
| Where the use of DDT is recommended | When the use of DDT is NOT recommended |

Both formulas approved by Dept. of Agriculture


Shown here is the New Five Pound Aerosol Insecticide Bomb Available for Commercial Use.

Suggested for Resale To: Greenhouses, Dairy Farms, Mushroom Growers, Private Estates, Ranches, Florists, Summer Resorts, Stock Farms and others, for control of numerous agricultural and household insect pests.

A number of good territories still open for distributors with setup for DIRECT sales to agricultural and commercial users. Income continues after original sale is made. Refill is a steady source of revenue. Write for further details.

EQUIPPED WITH HANDLE GRIP

WELL BALANCED

POWERFUL ATOMIZED MIST

READY FOR INSTANT USE

REFILLABLE AT LOW COST

LASTS 5 TIMES AS LONG AS AVERAGE BOMB

IMMEDIATE DELIVERY

# EDCO CORPORATION

**MANUFACTURERS OF MULTI PRODUCTS**
**AT NEWARK, DELAWARE**

# TECHNICAL Briefs

*Recent Technical Developments in the Agricultural Chemical Field*

### Black Cherry Aphid Control

Destroying the eggs of black cherry aphid has been accomplished with best results by applying sprays before the buds break rather than after the buds are open, according to experiments made at the New York State Experiment Station at Geneva, N. Y. Prof. F. Z. Hartzell, entomologist at the experiment station states that these findings are confirmed by the experience of growers: that dormant sprays containing two gallons of tar oil, properly emulsified, in 100 gallons of spray mixture give satisfactory results. During the past few years, various kinds of dinitro compounds, known as "DN" have been used both with and without oil. Although for the most part, aphid populations have been too low in the test orchards in the trial periods to give very conclusive results, it is believed that the tests have established the safeness of DN sprays on cherry buds in the dormant state.

The development of aphids is governed by various factors including the weather, but under favorable conditions as many as eleven generations may develop on cherry foliage by the end of July. Feeding of these insects if present in large numbers affects the size and flavor of the fruit. Also a secretion known as "honeydew" produces a sticky and unattractive appearance of the fruit, especially objectionable if it is to be sold as fresh fruit. The development of a sooty fungus in the honeydew may contribute further to the unsightly appearance of the cherries. Sweet cherries are more commonly infested than sour cherries and young sweet cherry stock may be seriously stunted in the nursery.

•

### DDT Safe on Potato Tubers

The rumor that potato tubers absorb DDT and thus create a potential hazard to human consumers was given a flat denial recently by Dr. P. N. Annand, chief of the Bureau of Entomology and Plant Quarantine, U.S.D.A. Dr. Annand cites tests made in the Yakima Valley, in Maryland and Maine where treatment included combined emulsion sprays, aerosols and water-suspension sprays, according to reports in the *A.I.F. News* of April, 1946. The report states that "no hazard to human health could result through the consumption of potato tubers the foliage of which had been treated with DDT at the dosages and formulations discussed herein."

The tubers were further tested by "the Schechter et al. colorimetric method of analysis," which is so "extremely sensitive" that "chemists have determined the presence of as little as one part of DDT in 100 million parts of water. . . . No DDT was found in any of the tuber samples."

•

### DDT in Poultry Use

DDT has proved effective in the control of certain pests which infest the poultry house, according to a recent report made by the New Jersey State Agricultural Experiment Station. A 3 per cent petroleum base DDT spray, painted on the roosts was found to be effective in controlling bed bugs. It was also found that a 3 per cent dust combination is effective when applied to nests. When sprayed over the roosts and droppings it proved effective against maggots. For the control of flies and mosquitoes, a 5 per cent solution should be used during the height of the season. At other times a 2½ per cent solution will prove satisfactory. The use of DDT offers little encouragement for control of the common chicken mite, however, according to their findings.

•

### Scab Control Bulletin

New York State Agricultural Experiment Station at Geneva, N. Y., has published a bulletin describing results of nine years' tests in reducing over-wintering apple scab inoculum in orchards. Ground sprays were used early this season to reduce the carry-over of scab spores in a number of orchards. In orchards with less than 5 per cent of the overwintered leaves harboring scab spores scab control can be accomplished with lower concentrations of sulfur and with fewer applications of spray than in orchards where there is a heavy carry-over of inoculum, says the pamphlet. This bulletin is available from the Station.

•

### DDT Bee Mortality

In a recent press release, Geigy Co., Inc., New York, summarizes some of the recent findings relative to the effect of DDT on bees. The release quotes the U. S. Department of Agriculture as saying "There is evidence that beekeepers may come around to view DDT as a promising relief from arsenic poisoning of bees," and also quotes various other agricultural publications in this connection. Typical of the findings quoted is the recent report of the *Utah Farmer* which records the findings of H. A. Scullen, associate entomologist at Oregon State college experiment station. "Where DDT was applied to a field, one or more colonies of bees were put in or near the field where their activities could be observed,"

he says. "Observations made upon colonies in or near the dusted fields showed no evidence of the bees having been killed," Dr. Scullen concluded. In at least two dusted fields bees were practically absent from the field several days following the dusting, but returned later in normal numbers. In the other fields there was a noticeable decrease in honey bees for two days, but the population soon returned to normal. Dr. Scullen is quoted further as saying that "further studies will be necessary before it can be said positively that the bees are not killed by DDT."

•

## Rotenone-DDT for Ticks

Experimental work on a combination DDT and rotenone liquid insecticide has been carried on at the Inter-American Institute of Agricultural Sciences, in Costa Rica, under the direction of Robert L. Squibb. Applied in a fine spray, the product was found to clean up 85 per cent to 90 per cent of the cattle ticks on heavily infested animals over the period of a week. Use of this method is reported to be as effective as tank dipping.

•

## Insect, Rodent Data

The Coordination Center of the National Research Council Insect Control Committee has prepared and is now releasing abstracts of data developed during the war years by agencies such as the Office of Scientific Research and Development, Bureau of Entomology and Plant Quarantine of the U.S.D.A., the U. S. Public Health Service, the Army, the Navy, the Food and Drug Administration and by certain of our allies.

The committee explains that a large amount of theoretical and practical information was accumulated during the war years, much of which could not be distributed at the time because of security considerations. Part of the information on insect and rodent control collected by the Committee represents a unique collection of results of a variety of biological tests performed on a series of chemical compounds. This information is such that additional data may be added as published, according to the Committee. Bulletins are available from National Research Council. 2101 Constitution Ave., Washington.

LEAVES AND TWIGS FROM YOUNG ORANGE TREES SPRAYED AND UNSPRAYED WITH ZINC COMPOUND—38% Zn.

SPRAYED NOV. 15, 1945

| | | |
|---|---|---|
| Lime Sulphur Solution | 1½ | gals |
| Zinc Compound-38 (38% Zn) | 3 | lbs. |
| Wettable Sulphur | 10 | lbs. |
| Water | 100 | gals. |

NOTICE

Early growth, several leaves per twig,
Large normal leaves,
No frenching or zinc deficiency,

UNSPRAYED

NOTICE

Delayed growth, small, few and chlorotic leaves,
Late growth and Severe frenching or zinc deficiency.

(Work done under the direction of Dr. Ralph L. Miller, Orlando, Fla.)

•

## Late Spray for Tomatoes

Delayed spraying of heavy applications of 8-4-100 Bordeaux mixture increased tomato yields in Indiana, according to a report by John D. Hartman of the Horticultural Department of Purdue University. By delaying first spray operations until leaf diseases appear, or until conditions in mid-summer are favorable for their widespread development, labor and materials can be saved, he reports. Test plot yields per acre, in some locations showed marked differences between sprayed and unsprayed plants. On a Frankfort plot, 12.3 tons per acre were gathered from sprayed plants, while the unsprayed portion yielded but 4.5 tons of tomatoes. The average yield on sprayed as against unsprayed tomatoes in the 16 locations was 10.2 tons compared to 8.4 tons.

Sprays were applied at least four times on all plots except one which received three. First date of spraying was between July 20 and 27, and the last ones between August 27 and 31. The 8-4-100 Bordeaux was applied at an excessive rate of more than 300 gallons per acre with an orchard spray broom.

## Zinc Compound Effective

W. R. E. Andrews Sales Co. of Philadelphia reports the results of application of its new zinc compound on fruit trees in Florida, Georgia, South Carolina and New Jersey. The new material is a combination of zinc sulfate and basic zinc carbonate. It is so blended that the final product does not cake and is said to require only half the quantity of lime ordinarily used when a zinc Bordeaux is made. A typical analysis of the product is as follows:

| | | |
|---|---|---|
| | Zn | 40.8 % |
| Sulfate ..... | S | 5.71% |
| Sulfide ..... | S | 0.19% |
| | $CO_2$ | 10.00% |
| Zinc Sulfate . | | 51.16% |
| Basic zinc carbonate-hydroxide ..... | | 49.66% |

Product is sold guaranteed 38% zinc as metallic.

The new compound is said to be in use in large quantities, in the Florida area particularly. It has also been added to fertilizer mixtures throughout Florida with good results. The accompanying photographs (above) give pictorial evidence of the effect of using the new Andrews compound on young orange trees.

•

## Wound Powder for Livestock

A war-developed wound powder containing 83 per cent pure crystal urea has been adapted for use on livestock, according to the January-February *Agricultural News Letter*, (DuPont). The article describes

methods used and reports that the new powder is obtainable through veterinarians, and that at least one biological house is packaging it in spring-top dusting cans. In addition to the 83 per cent pure crystal urea, the powder contains calcium phosphate 2 per cent, sulfanilamide 13 per cent and sulfathiazole 2 per cent.

•

### Thiouracil-Fed Pigs Gain

Economies amounting to as much as 40 per cent in feeding pigs by including thiouracil as 0.2 per cent of the ration were found in recent experiments conducted at the State University of Missouri by M. E. Muhrer and A. G. Hogan. The thiouracil-fed animals gained heavily in weight as compared to those receiving regular fare, but the investigators report that the gain was not true growth since the pigs on special diet were wider, shorter and not as tall as the others. The rapid growth was due to deposition of excessive amounts of fat. Thiouracil retards action of the thyroid gland and lowers the rate of metabolism in swine.

These results differ from previously-reported experiments with thiouracil-fed poultry, in which it was found that the drug reduced the rate of growth and increased the amount of feed required to produce each pound of gain.

•

### Potato Psyllid Control

Control of the potato psyllid and flea beetle can be exercised by dusting with a mixture of sulfur-cryolite 3:1 or 4:1, sulfur-basic copper arsenate 3:1 or sulfur-DDT 2½:5 per cent, according to results of experiments conducted by the University of Wyoming at the Torrington experimental farm. Nine dust treatments and one spray treatment were tested in comparison with untreated checks. The treatments were applied to 8-row plots of Bliss Triumph potatoes and replicated four times. Five applications of the treatments were made at later dates when the plants were at various stages of development. Dusts were applied at approximately 35 pounds per acre and the spray at 80 to 100 gallons per acre.

### DDT on Beetle Larvae

Tests being conducted by Dr. J. A. Adams, entomologist of the New York State Experiment Station, Geneva, N. Y., indicate that the use of DDT as an aid in controlling Japanese beetle larvae in the soil shows much promise. The DDT is being used as a substitute for arsenate of lead, in these experiments carried out in the Hudson River Valley.

Preliminary tests made with DDT used at the rate of 25 pounds to the acre reveal that this treatment is as effective as a 50-pound application of lead arsenate. DDT is believed to be no more toxic to warm-blooded animals than equal amounts of arsenate of lead, according to the report. In addition, only one-twentieth as much insecticide need be added to the soil so that food crops probably could be grown on DDT-treated soil with safety much sooner than where arsenate of lead is used.

•

### Squash Bug Controlled

Ten per cent sabadilla dust was used successfully for control of squash, pumpkin and cantaloupe squash bug, according to *Farm Flashes*, published by Oklahoma Agricultural Experiment Station, Stillwater. The insecticide was also used to protect sweet corn from chinch bugs, being dusted in the base of the plants where the bugs were congregated. Sabadilla will be on the market this season under various trade names, says the publication, or can be bought in concentrated form and diluted with talc, pyrophyllite, or lime.

•

### Phenothiazine for Cattle

When given in proper dosage, Phenothiazine can be "presumed to be physiologically nontoxic to cattle," according to a report by George E. Cauthen of the U.S.D.A. Regional Animal Disease Laboratory, Auburn, Ala. He reports that the chemical has been widely used as an anthelmintic for the removal of gastrointestinal nematodes from cattle, as well as from other classes of livestock with generally satisfactory results.

Mr. Cauthen also calls attention to the fact that in some cases unfavorable reactions in cattle were attributed to the use of this drug. Temporary blindness, anemia and death were reported to have occurred in poor and weakened animals. These and other reports have discouraged use of phenothiazine in some localities, and in others caused administration of the drug in insufficiently large doses for best results. Recommended dosage of phenothiazine, according to Mr. Cauthen, is 20 grams per 100 lbs. bodyweight, with a maximum of 60 grams per animal.

•

### Potato Sprout Control

A product which retards sprouting in stored potatoes and root and top growth in such root crops as beets, carrots, turnips and rutabagas has been developed and is now commercially available. It is the methyl ester of alpha naphthalene acetic acid. Dr. Ora Smith, professor of vegetable crops at Cornell University in an address before the Cornell Insecticide and Fungicide Conference recently, discussed the manner in which the new product works, and observed that several million bushels of potatoes are lost annually through sprout growth and resultant shriveling. Where it is impossible to keep storage temperature under 40 degrees, sprouting is a particular problem.

The new sprout retardant is applied as a dust, or through shredded paper which has been soaked in the chemical. Potatoes thus treated may then be kept dormant or with only very short sprouts for four or five months at 50 to 55 degrees, or for shorter periods at higher temperatures. Treatment has been successful with Katahdin, Earlaine No. 2, Sebago and Sequoia, Red Warba, Triumph, Cobbler, Chippewa, Russet Burbank and Russet Rural potatoes.

No undesirable effects were noticeable on table stock potatoes, Dr. Smith said, but added that treated potatoes apparently grew more slowly during the early part of the season, which causes the experimenters to recommend that potatoes to be used for seed should not be treated until more data is available.

HERCULES
Thanite, Thanasol 70
TOXICANTS

# For Better

## Thanite Sprays Control Stable, Horn, and House Flies

Effective cattle sprays must combat all three species of flies—to give top milk production. Whether dairy operators require oil-base or water-base sprays, you can meet the situation with Thanite*, Thanasol 70, and other Hercules toxicants.

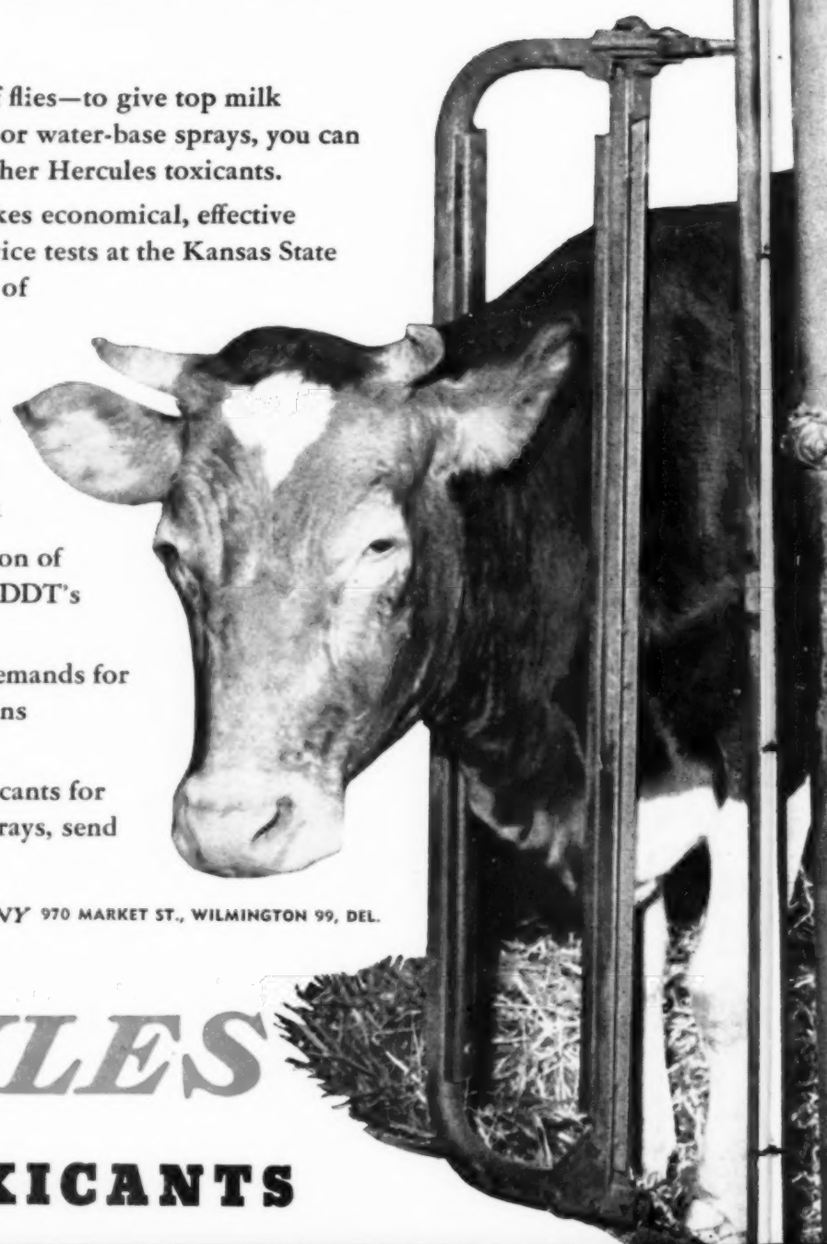
Thanite, widely used on milk cattle since 1940, makes economical, effective oil-base sprays with high repellency. In extensive service tests at the Kansas State College Farm, it was adjudged "best in killing power of any single toxicant used in base oil."

Thanasol 70 makes the toxic properties of Thanite available in water-base cattle sprays. A concentration of only 4.3 per cent Thanasol 70 (equivalent to 3 per cent Thanite) yields a Peet-Grady kill that is 40.9 percentage points higher than the O.T.I.

Thanasol 70 + DDT Concentrate gives a combination of Thanite's famed rapid knockdown and high kill with DDT's equally famed slow-but-sure action.

Hercules Water-Miscible DDT Concentrate meets demands for a straight residual type DDT spray for barns. It contains 25 per cent DDT by weight.

For specific details on these and other Hercules toxicants for livestock sprays, flea powders, dips, and household sprays, send for new 32-page book, "The Thanite Family."

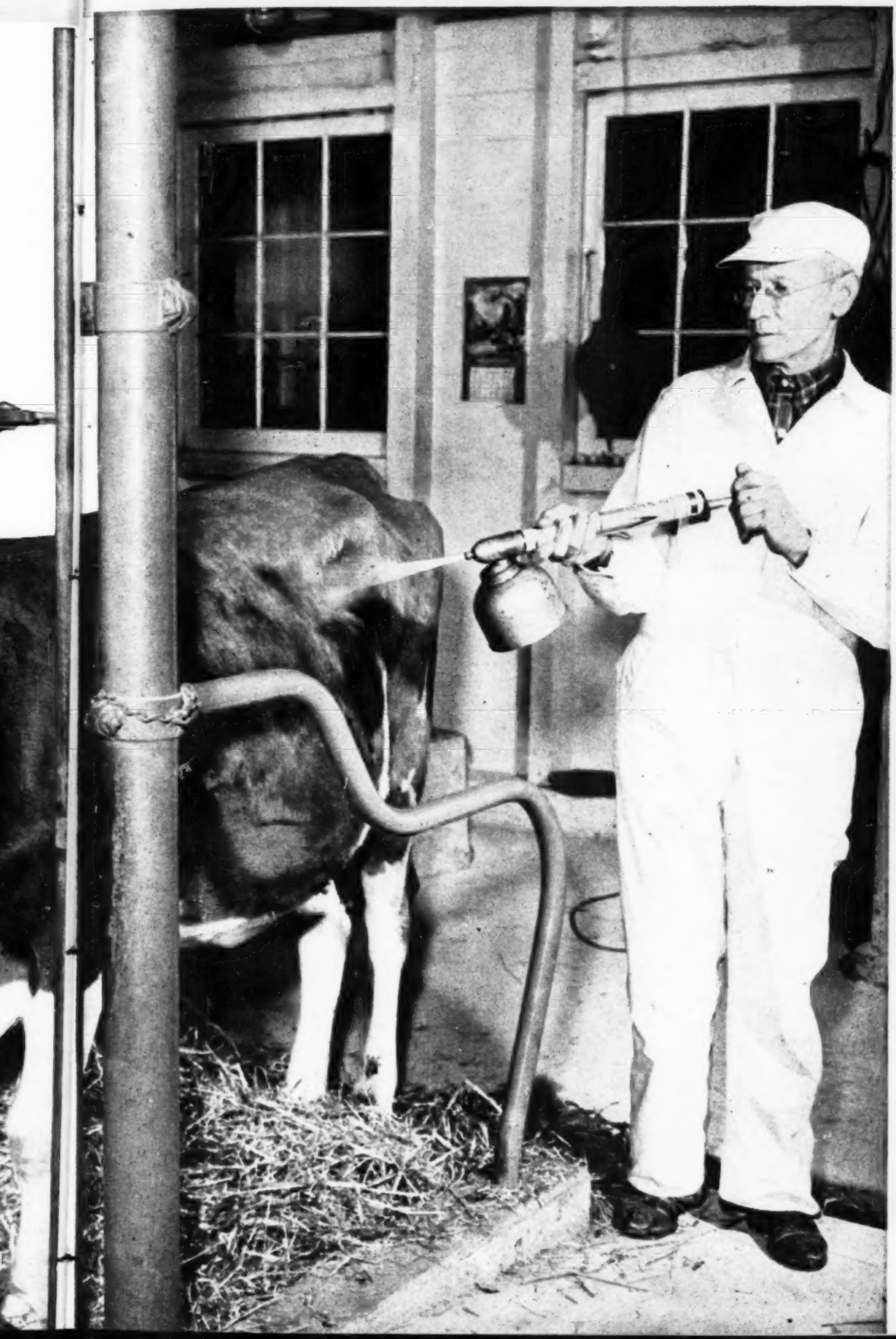


NAVAL STORES DEPARTMENT *HERCULES POWDER COMPANY* 970 MARKET ST., WILMINGTON 99, DEL.

*HERCULES*

**MODERN TOXICANTS**

# er Livestock Sprays



## Hercules' new family of toxicants

•

### THANITE

Makes a fast-knockdown, high-kill spra effective against household pests such a flies, mosquitoes, bedbugs, silverfish, ants and moths.

### THANITE + DDT CONCENTRATE

The addition of DDT to Thanite utilizes th best features of each toxicant. Makes a 100% "Knockdown," 100% "Kill" spray at a ver low cost.

### THANASOL 70

A water-base toxicant especially recom mended for use in kennels and on livestock Thorough tests have demonstrated its effec tiveness, its safety, and long-lasting repel lency, in both sprays and dips.

### THANASOL 70 + DDT CONCENTRATE

Water-dispersible—combines residual effec against horn flies with speedy knockdown and high kill of stable flies. Ideal for makin fully-effective livestock sprays.

### DDT (AEROSOL GRADE)

Made only by Hercules and designed specifi cally for use in Aerosol bombs. Now avail able in quantity.

### WATER-MISCIBLE DDT CONCENTRATE

Water-dispersible—for use in spraying barns city dumps, garbage pails, industrial build ings, where the residual effect of DDT i required in the most economical form.

### OIL-SOLUBLE DDT CONCENTRATE

A general-purpose concentrate for use whe ever DDT in oil solution is required.

# *What's Coming . . .*

## *in AGRICULTURAL CHEMICALS?*

HERE are a few of the articles and discussions by leading authorities in the field and reports on investigations by our editorial staff to appear in early issues of AGRICULTURAL CHEMICALS.

●

"Plant Hormones, Their Place in Agriculture"

"What's New in Seed Disinfection?"

"Modern Fumigation of Stored Grains and Foods"

"DDT in Mushroom Culture"

"Study of the Small Package Market for Garden Insecticides"

"Custom Spraying—Correct Insecticide Use by the Professional Sprayer"

"Greenhouse Fumigation and Insect Control"

"Electrostatic Effects in Dust Clouds"

"Economic Aspects of Weed Control"

"New Techniques in Airplane Dusting"

"Efficient Methods of Dust Mixing"

"Soil Fumigation, — Products and Methods"

"More Business for the Custom Sprayer"

"Do's and Don'ts in Dairy Spray Uses"

"Wood Preserving Chemicals"

"A Study of Bags and Bag Filling and Closing"

"The Trend in Stock Dips"

"The Future of Arsenic as a Basic Insecticide"

"Chemicals of Dairy Sanitation"

"Weed Control Education of the Consumer"

●

The foregoing and a host of other subjects on processing, packaging, distribution, uses, new developments, and attendant problems in the chemicals for agriculture are included in the long range editorial plans of AGRICULTURAL CHEMICALS.

Yearly subscription price is $3.00. If you desire that your subscription be entered, use the postage-free handy order form found elsewhere in this issue.

# AGRICULTURAL CHEMICALS

254 West 31st Street New York 1, N. Y.

# New Trade Marks . . .

**Application has recently been made to the U. S. Patent Office for registration of the following trade-marks for products in the agricultural chemical field, and the marks listed have been published in the March issues of the OFFICIAL GAZETTE. The Patent Office requires that notice of any opposition to registration of a trade-mark be filed within thirty days of publication in the GAZETTE, accompanied by a fee of ten dollars.**

## Trade Mark Applications

BOVOC—This in capital letters. For antibacterial preparation for veterinary use. Filed October 2, 1945 by Sharp & Dohme, Inc., Philadelphia. Claims use since September 11, 1945.

AVALANCHE—Designed in old style capitals and lower case letters arranged in descending form, the name is to be used for insecticides. Filed Nov. 2, 1945, by Chemurgic Corp., Richmond, Calif. Claims use since Sept. 6, 1945.

GAMTOX—In capital letters. For parasiticides — namely, insecticides, fungicides and germicides. Filed Oct. 30, 1945 by California Spray-Chemical Corp., Wilmington, Del., and Richmond, Calif. Claims use since Sept. 4, 1945.

INTERNATIONAL — Bold capital letters for chemicals—namely aluminum stearate and insecticides. Filed Aug. 25, 1945 by International Lubricant Corp., New Orleans. Claims use since March, 1937 on goods named herein; and since May, 1938 on aluminum stearate.

TORMENT DUST — Light face capital letters, for insecticides. Filed Sept. 17, 1945 by Ade B. Williams, Orlando, Fla. Claims use since December 5, 1938.

S A 50—In bold capitals, for insecticides. Filed Aug. 23, 1945 by Southern Agricultural Insecticides, Hendersonville, N. C. Claims use since 1944.

CHICURE — Capital letters, for dehydrated manure. Filed Sept. 11, 1945 by Joseph A. French, Newark, N. J. Claims use since July 12, 1945.

FOWLURE—Capital letters, for dehydrated manure. Filed Sept. 11, 1945 by Joseph A. French, Newark, N. J. Claims use since July 12, 1945.

JAFCO—Capital letters, for dehydrated manure. Filed Sept. 11, 1945 by Joseph A. French, Newark, N. J. Claims use since July 12, 1945.

HOMESTEAD — In capital letters with log cabin motif, for fertilizers. Filed April 23, 1945 by American Agricultural Chemical Co., New York. Claims use since January, 1875 on word "Homestead"; and since Nov. 15, 1944 on whole mark.

FUNGITEX—In open letters in domestic animal motif, preparation in liquid form for external treatment of external fungus skin infections on dogs, cats, and other domestic animals. Filed October 22, 1945 by Magnitex Company, Inc., Saco, Maine. Claims use since or about Feb. 1, 1945.

GAMMACIDE—In bold capitals. For parasiticides, namely, insecticides, fungicides and germicides. Filed Nov. 13, 1945 by California Spray-Chemical Corp., Wilmington, Del. Claims use since September 4, 1945.

PUR-O-PEL — In hyphenated capital letters, for livestock spray and insecticides. Filed August 29, 1945 by Puritan Laboratories, Inc., Des Moines, Ia. Claims use since May 15, 1945.

ATOMIC—In black capital letters, for insecticides. Filed September 20, 1945 by Worthington Products Co., Inc., Arlington, Va. Claims use since Aug. 18, 1945.

P-C-H—In large capital letters, for insecticides. Filed Oct. 20, 1945, by Chipman Chemical Co., Bound Brook, N. J. Claims use since Dec. 5, 1944.

TERSAN—In capital letters, for agricultural and horticultural fungicides. Filed Nov. 8, 1945, by Du Pont Semesan Co., Wilmington, Del., assignor to E. I. du Pont de Nemours & Co., Wilmington. Claims use since Sept. 29, 1945.

PESTRID—In large black capital letters, for disinfectants, insecticides and deodorants. Filed May 31, 1945 by Daniel J. Klein, doing business as Allied Exterminating Co., New York. Claims use since Jan. 15, 1945.

## Trade Marks Granted

419,100. Insecticidal Cattle Spray. L. Sonneborn Sons, Inc., New York. Filed February 24, 1945.

419,154. Cultured Extract Used as a Spray to Preclude Invasion of Rodents. William B. Ward Co., Kansas City, Mo. Filed June 11, 1945.

419,486. Insecticide. Georgia-Carolina Oil Co., Macon, Ga. Filed May 11, 1945.

419,487. Agricultural Chemicals Having Insecticidal Properties. Pennsylvania Salt Mfg. Co., Philadelphia. Filed May 14, 1945.

419,508. Mixture of Ingredients for Making Insecticides and Fungicides. Cooperative Seed & Farm Service, Inc., Richmond, Va. Filed July 18, 1945.

419,774. Thiouracil Preparation for Use in Veterinary Medicine. Lederle Laboratories, Inc., New York. Filed July 13, 1945.

419,777. All Purpose Insect Spray, Grains for Destroying Mice, Volatile Insecticide and Roach Powder. Arrow Engineering & Chemical Co., Flint, Mich. Filed July 14, 1945.

419,806. Disinfectant and Germicidal Treatment of Drinking Water for Chickens and Turkeys. Beebe Laboratories, Inc., St. Paul, Minn. Filed August 3, 1945.

420,021. Insecticide. Midwest Engineering & Tool Co., Neodesha, Kans., assignor to Airosol, Inc., Neodesha, Kans. Filed August 4, 1945.

420,078. Spray Gun for Insecticides. Phillips Petroleum Co.,

(*Continued on Page 62*)

# Industry Patents

**The following patents have recently been issued by the U. S. Patent Office on products and devices in the agricultural chemical field. Copies of the patents may be obtained at 10c each by addressing the U. S. Patent Office, Washington 25, D. C.**

No. 2,394,683. POISONING COMPOSITION AND METHOD. Patent granted February 12 to Ira L. Griffin and Caddis F. Morriss, Charlotte, N. C. An insecticide composition comprising citrus sirup and calcium arsenate.

* * *

No. 2,395,219. FERTILIZER. Patent granted February 19, 1946, to Stapleton D. Gooch, Lake Wales, Fla., assignor to Pembroke Chemical Corp., Pembroke, Fla. The process of treating phosphate of alumina clay, which comprises treating such clay as it comes from its source to physically remove inert impurities therefrom, heat treating such physically purified material for a sufficient period of time at a temperature lying in a range of from 700 degrees F. to 1100 degrees F. as a result of which the pH of the treated material lies in a range of from 6.5 to 7.5, cooling the heat treated material, and fine grinding the cooled material, whereby the available $P_2O_5$ is significantly increased over that of the raw material.

* * *

No. 2,395,440. INSECTICIDAL AND FUNGICIDAL COMPOSITIONS. Patent granted February 26, 1946, to Arthur Donald Ainley and William Harris Davies, Blackley, Manchester, England, assignors to Imperial Chemical Industries, Ltd., a corporation of Great Britain. An insecticidal and fungicidal composition containing as an essential active ingredient a formaldehyde-ammonium aryl dithiocarbamate interaction product obtained by reacting formaldehyde with an ammonium aryl dithiocarbamate having the formula $RNH\text{-}CS\text{-}S\text{-}NH_4$ in which R is aryl, in the proportions of at least one mole and not more than 6 moles of formaldehyde for each mole of ammonium aryl dithiocarbamate in a cooled aqueous solution, and a carrier therefor.

* * *

No. 2,396,012. INSECT REPELLENT COMPOSITIONS, patent granted March 5, 1946 to Howard A. Jones and Bernard V. Travis, Orlando, Fla. Dedicated to the free use of the People of the United States. A method of repelling insects comprising applying to the area from which the insects are to be repelled an insect repellent containing 2-ethyl-n-caproic acid as its essential active ingredient.

* * *

No. 2,396,013. INSECT REPELLENT COMPOSITIONS. Patent granted March 5, 1946 to Howard A. Jones and Bernard V. Travis, Orlando, Florida. Dedicated to the free use of the People of the United States. An insect repellent composition comprising 2-phenylcyclohexanol incorporated in a carrier.

* * *

No. 2,396,019. INSECTICIDES. Patent granted March 5, 1946, to Charles W. Murray, Glenside, Pa., assignor to Claude R. Wickard, as Secretary of Agriculture of the United States of America, and his successors in office. An insecticide comprising a carrier of finely divided, fibrous, organic material dyed with the salt of an acid azo dye and nicotine.

* * *

No. 2,396,264. FUNGICIDE. Patent granted March 12, 1946, to Max N. Huffman, Woodworth, Wis., assignor to U. S. Standard Products Co., Woodworth, Wis. A chemical compound, which comprises a 4-chloro-3,5-dimethylphenyl hydrogen camphorate.

* * *

No. 2,396,513. METHODS AND COMPOSITIONS FOR KILLING WEEDS. Patent granted March 12, 1946, to Franklin D. Jones, Upper Darby, Pa., assignor to American Chemical Paint Co., Ambler, Pa. A method for killing weeds in an active state of growth, which consists in applying to the weeds a substance selected from the group consisting of phenoxy, phenylmercapto, and naphtylimino monocaroxylic aliphatic acids, their salts and esters, in a concentration of at least about .1% by weight.

* * *

No. 2,396,983. PARASITICIDAL COMPOSITIONS. Patented March 19, 1946 by Edgar C. Britton, Gerald H. Coleman and Karl D. G. Clack, Midland, Mich., assignors to the Dow Chemical Co., Midland. A method for preparing petroleum distillate solutions of rotenone and rotenone-containing extracts comprising the step of contacting the rotenone product with the petroleum distillate in the presence of a solubilizer consisting essentially of secondary-butylphenol.

* * *

No. 2,397,423. PARASITICIDAL PREPARATIONS. Patented March 26, 1946, by Elbert C. Ladd, Passaic, N. J., assignor to United States Rubber Co., New York. The method of protecting organic material against attack by microorganisms which comprises treating said organic material with material selected from the group consisting of 3,6-di(tertiary amino) thiaxanthenes, 3,6-di(tertiary amino) thiaxanthene salts, 3,6-di(tertiary amino) thiaxanthydrols, and 3,6-di(tertiary amino) thiaxanthrones.

* * *

## Promotions at Monsanto

Paul G. Marsh has been named assistant production manager of the Organic Chemicals Division of Monsanto Chemical Co., St. Louis. It is also announced that A. J. Pastene is now manager of the company's John F. Queeny plant in St. Louis. Another promotion at Monsanto included that of E. T. Stehlby to assistant plant manager of the Queeny plant.

* * *

## Stored Seed Protection

Magnesium oxide applied at 1 oz. per bushel of seed, and 3% DDT dust at ½ oz. per bushel has proved effective in protecting stored seed according to R. T. Cotton and J. C. Frankenfeld in *Seed World*, Nov. 2, 1945. Treated seed should not be used for food, they warned.

# HERBICIDE
THE ORIGINAL
# WEED KILLER
*ON THE MARKET SINCE 1888*

HERBICIDE is not a selective weed killer — HERBICIDE kills all weeds including grass on roadways, paths, tennis courts, or any place where weeds and grass are unwanted. Leading railroads too, use HERBICIDE to keep roadbeds weed-free.

***DEALERS—Here Is a Profitable Group***

READE *COLLOIDAL PROCESSED* SPRAY PRODUCTS

| | |
|---|---|
| ARSENATE OF LEAD | (Insecticide) |
| SULPHUR | (Fungicide) |
| RED COPPER OXIDE | (Seed Disinfectant) |

## IS BAD NEWS FOR WEEDS GOOD NEWS FOR YOU

HERBICIDE is the original chemical weed killer, and has been on the market for nearly sixty years. During these years, chemists have been unable to find a more powerful or a more effective chemical for destroying vegetation. HERBICIDE is the standard of quality, and provides outstanding . . .

***EFFICIENCY:*** One application per season kills weeds and grass, roots and all.

***ECONOMY:*** It allows high dilution with water without loss of killing power.

***SAFETY:*** Does not affect or discolor stone, wood or metal—and eliminates fire hazards.

***SATISFACTION:*** Herbicide is sold with a money-back guarantee if not satisfied.

READE EST 1883

*Dealers — Distributors — We offer an interesting proposition. Write for details.*

**READE MANUFACTURING CO.** JERSEY CITY 2, NEW JERSEY

# DULA SPRAYMASTER

*Sprays 'Em to Death!* { ROACHES · FLIES · SPIDERS · BUGS
MOSQUITOES · ALL INSECTS

## A Boon to Agriculture and Dairy Farmers, Nurserymen, etc.


**ATTENTION**
**JOBBERS DISTRIBUTORS**
Spraymaster Representation Offers You Real Opportunity for Sales and Profit
**GET COMPLETE DETAILS NOW**
*Write Today!*

Dula SPRAYMASTER does a thorough and complete pest-riddance job . . . steam vapor penetrates into all nooks, crevices and hideouts. Quick, clean, automatic, safe — Depend on Spraymaster "to give 'em the works"!

Dula SPRAYMASTER effectively sprays all types of liquid insecticides. Operates electrically. Method presents no fire hazard. Positive results assured. If your jobber hasn't as yet stocked Spraymaster, write to us direct. Please furnish your jobber's name and address. (We do not manufacture or sell insecticides.)

**DULA MANUFACTURING CO., INC.**
351 ATLANTIC AVE., BROOKLYN 2, N. Y.

# Suppliers' Bulletins

### Can Co. Prints DDT Booklet

The Research Department of Continental Can Co., Chicago, has published a 24-page booklet on the subject of DDT. The booklet discusses the place of DDT in the insecticide field, its chemistry and formulations, toxicity, and possible future uses. The effect of DDT on plants is viewed, and the booklet also gives information regarding packaging and labeling. Three tables are presented to illustrate the lethal effect of DDT formulations upon various insects, its effect upon plants, and the manner in which the insecticide affects various types of metal plate used in the manufacture of containers. Authors are H. E. Peterson and W. G. Palmer of Continental Can Co.

•

### Reprint on "Velsicol 1068"

Velsicol Corporation, 120 E. Pearson St., Chicago 11, announces the availability of a paper on "Velsicol 1068," insecticide, reprinted from the December 1945 issue of the *Journal of Economic Entomology*. Copies may be had by writing the Velsicol Corporation.

•

### Geigy Co. DDT Booklet

A 24-page booklet entitled "Mechanism of Intoxication of DDT Insecticides in Insects and Warm-blooded Animals" is being distributed by Geigy Company, Inc. of New York. The volume, authored by Dr. Paul Lauger, director of research, J. E. Geigy, S.A., Basle, Switzerland, is a copy of material presented at a recent joint meeting of the Army Committee for Insect and Rodent Control, and the O.S.R.D. Insect Control Committee.

Subject matter relates in detail various experiments with DDT in different strengths, describing the effects on rabbits and rats as well as the reactions on a variety of insect pests. The book is complete with an array of charts, graphs and chemical formula diagrams to tabulate results of experiments. Copies of the report are available from Geigy Company, Inc., 89 Barclay Street, New York 8, N. Y., or from *Agricultural Chemicals*.

•

### Hazardous Products

A booklet, "Public Relations for Hazardous Products" written by L. W. Hutchins is available from the Safety Research Institute, 420 Lexington Ave., New York 17. The pamphlet, a reprint from the Public Relations Directory and Year Book for 1945, contains information of interest to manufacturers of insecticides, fungicides, rodenticides and other chemicals of possible danger to the user. The author recommends that manufacturers should first find for themselves hazards of their products and make every effort to control them. The consumer should then be given proper information regarding the situation. Copies of the booklet are available.

•

### Rodenticide Folder by Linck

O. E. Linck Co., Inc., Montclair, N. J., has published an illustrated circular on the complete TAT line of insecticides, rodenticides and weed killers. The ten page folder includes descriptions of its Formula 83 for rat control, using the new toxic agent, "Antu" carrying both a feeding and drinking bait in each package. The Linck Co. was formerly known as Soilicide Laboratories.

•

### Geigy Co. Distributes Chart

Geigy Company, Inc. of New York has prepared an educational chart depicting in graphic form the compatibility of its DDT insecticides with various materials commonly used in pest control schedules. The chart, printed on 8½ x 11" cardboard stock in three colors, is in the form of a wheel with the "rim" divided into five sections, insecticides, oils, adjuvants, inert ingredients and fungicides. The different types of insecticides, fungicides, etc., are keyed to indicate their compatibility with DDT. Copies of the chart are available from Geigy Company, Inc., 89-91 Barclay St., New York 8.

•

### Du Pont Dormant Spray

E. I. Du Pont de Nemours & Co., Wilmington, announces the addition to its line of agricultural chemicals of the product "Krenite," a water-soluble dinitro dormant spray used as an insecticide or as a fungicide. The new liquid contains sodium dinitro-ortho-cresylate as its active ingredient. The manufacturers state that the product is for use on certain orchard crops, small fruit trees and ornamentals when the plants are dormant. A leaflet giving directions for use of the product is available.

•

### Hercules "Thanite" Booklet

Hercules Powder Co., Wilmington, has published a new 32-page booklet entitled "The Thanite Family" which gives detailed data on "Thanite," DDT, and derivatives and combinations of these insecticide materials. The book carries new information on the use of these concentrates in household sprays, stock sprays, flea powders and dips, and other pest control operations. Comparative data is given on "Thanite" and other insect control materials, including a glossary of terms peculiar to the insecticide industry, and a pictorial section. The listed data is based on long research in Hercules toxicants against most common insects and is arranged in the form of practical information for the insecticide manufacturer.

•

### 'Deenate' Leaflet Available

A leaflet on "Deenate" DDT insecticides for agricultural use has been issued by Grasselli Chemicals Department of E. I. Du Pont de Nemours & Co., Wilmington, Del. The pamphlet presents suggestions based on experiments by the U.S.D.A., various state experiment-station investigations and on Du Pont research, dealing with use of "Deenate" for fruits, vegetables, cotton, farm buildings, livestock, stored grain, shade trees, etc.

# Equipment News

### Enoz Co. Testing Box

Enoz Chemical Co., Chicago, announces development of a portable insecticide testing box which is used by company representatives to illustrate visually the action of its various insecticide products.

•

### Sprayer by Lofstrand

A stainless steel sprayer which its makers say withstands corrosive action of insecticides is being marketed by the Lofstrand Company, Silver Spring, Md. Features of the sprayer, according to the manufacturers, include a shut-off valve in the hose, mesh strainers to prevent clogging by sediment, and light weight of the entire unit. The sprayer is recommended by its makers for use on poultry farms, dairies, barns and gardens as well as other applications. The product was first developed at request of U. S. Army Engineers for use of DDT.

New stainless steel sprayer being marketed by Lofstrand Co.

### Aerosol Applicator for DDT

A new machine for producing oil fogs containing DDT, on a field scale, is announced. It is a modification of the U.S. Navy's fog generator which produces aerosols too fine and light for insecticidal purposes. The fog particles from the new machine are heavier and less opaque, but they deposit the insecticide uniformly on plant surfaces. The machine is adaptable to production of fogs containing other oil-soluble insecticides. C. T. Vorhies and L. P. Wehrle. *Science* 102, 648.

•

### War Surplus for Farms

A number of chemical warfare appliances declared surplus are suitable for use in agriculture. Flamethrowers can be converted into excellent long-range sprayers for the agriculturist, and also have use as fire extinguishers. Smoke pots and smoke grenades have been found useful in killing insects and rodents on farms. Chlorine for purifying water, and various surplus chemical disinfectants and deodorants are also on the list for possible agricultural use.

•

### Form Sprayer Association

Chicago's Stevens Hotel was the birthplace of the National Association of Manufacturers of Spraying and Dusting Equipment when representatives of eight firms prominent in this field met recently to organize the group. The first president of the N.A.M.S.D.E. is G. H. Collier of Dobbins Manufacturing Co., Elkhart, Ind. Mr. Collier is also chairman of the executive board. H. E. Chapin of R. E. Chapin Mfg. Works, Inc. was named vice-president and vice-chairman of the executive board. D. P. Lewis of H. D. Hudson Manufacturing Co., Chicago, was elected treasurer.

Other members of the advisory board are as follows John L. Novak, Acmeline Mfg. Co., Traverse City, Mich.; R. C. Hudson of H. D. Hudson Mfg. Co., Chicago; John Arehart of Universal Metal Products Co., Saranac, Mich., and Thomas Burton of D. B. Smith & Co., Utica, N. Y. The group extended to Mr. Novak a vote of thanks for his work in bringing about the formation of the association. He acted as temporary chairman of the meeting.

•

### Aerosol Bomb By Edco

Edco Corporation, Newark, Del., has just introduced a new refillable five-pound aerosol bomb which will be sold under the name "Mul-T-Vapor." Designed especially for use in agricultural applications, it will be supplied with or without DDT in the formula. It is recommended for use around greenhouses, dairy farms, stock and fur farms, etc., for the control of flies, mosquitoes, roaches, moths, bedbugs, etc. It has a capacity of 750,000 to 1,250,000 cubic feet of gas, and is equipped with a handle grip. The insecticide spray which it dispenses is said not to leave any oily residue.

•

### Poison Weed Bulletin

In bulletin 388, Minnesota Agricultural Experiment Station University Farm, St. Paul, discusses "Weeds Poisonous to Livestock." Twenty-one of the more common poison weeds are treated in the copy, and illustrated under the headings of general description, toxicology, symptoms of poisoning, first aid and control. The bulletin points out the annual loss of livestock brought about through poisonous or injurious weedy plants found in pastures and meadows.

•

### Ragweed Pollen Bulletin

Michigan State College, East Lansing, offers reprints of articles from the Quarterly of the Michigan State Experiment Station, dealing with various phases of agricultural interest. Article 28-5, "Inhibition of Pollen Production in Ragweed by the Use of Chemical Sprays" is of interest, as is Bulletin 271 entitled "Controlling Diseases and Insects on Garden Flowers."

# The Listening Post

## By G. J. Haeussler

This column prepared especially for readers of AGRICULTURAL CHEMICALS. Mr. Haeussler is in charge of Insect Pest Survey and Information, Agricultural Research Administration, Bureau of Entomology and Plant Quarantine, U.S.D.A. His observations, based on latest reports from Bureau field representatives all over the country, will be a monthly feature.

AS we go into the crop season of 1946, the best information available on the more important insects requiring chemicals for control ties back largely to the status of these pests last fall. It is still somewhat early to tell how most of them fared over winter, and weather conditions this spring may, if highly favorable or especially unfavorable, alter the present outlook as regards certain pests in particular areas. So, without any attempt at predictions, let's look at the record as it now stands.

In all important apple-growing areas, the number of codling moth larvae that entered hibernation was unusually small last fall. In fact, overwintering larvae were generally so scarce the entomologists even had difficulty in collecting adequate stocks needed for experimental purposes.

The Japanese beetle, another pest against which fairly large amounts of lead arsenate are used, offers quite a different picture. Rainfall was plentiful and favorable for development of the egg and grub stages over the most of its range in the summer of 1945. A general increase in beetle populations appears probable for the coming season in contrast to the reduced population of adult beetles that occurred over most of the older infested territory last year.

Grasshopper surveys conducted last fall indicate that infestations of these pests may be slightly more extensive than in 1945. Population increases are indicated chiefly in Kansas, Oklahoma, Texas, Utah, and Wyoming. Threatening or severe infestations are anticipated principally in areas in eastern Montana, western and south central South Dakota, north central and eastern Wyoming, western Nebraska, and western Kansas.

Surveys in the fall of 1945 showed that hibernating populations of the European corn borer increased significantly over those of 1944 in most of the Corn Belt. The heaviest concentrations of the pest in the Corn Belt last fall was found in north-central Illinois.

Weather conditions were favorable for the development of the boll weevil in 1945, and infestations generally throughout the Cotton Belt were heavier than in any year since 1941. Examinations of surface trash made during the spring months indicate that large numbers of weevils survived hibernation and are ready to invade the cotton fields this year.

Reports on current insect conditions are already being received from the southern early crop areas. These indicate that populations of the potato leafhopper on beans have been generally of low level in Florida. Young bean plantings in northwestern Florida and southern Georgia remained free of insect pests through March. The first Mexican bean beetles of the season were observed during the last few days of March in the Charleston area of South Carolina and in northwestern and northeastern Florida. Cabbage caterpillars have not been reported more than moderately abundant on cabbage and related crops in South Carolina, Georgia, Florida, Alabama, Mississippi, southern Arizona and southern California. Climbing cutworms, spotted cucumber beetles, and the vegetable weevil have been active on the spring cabbage crop in the Charleston, S. C. area. The spotted cucumber beetle has also injured potatoes and lettuce in that state. By mid-March, the vegetable weevil was causing more damage than usual, especially to turnips, mustard, and spinach in home gardens of northern Florida, and was damaging lettuce in the Charleston, S. C. district. Slight damage to tobacco seedlings in northwestern Florida and to carrots at Charleston, S. C., was reported later in the month. The Colorado potato beetle appeared during the last half of March on the early potato crop in Florida and South Carolina. The onion thrips was present in late March in important numbers in many onion fields of southern Arizona and southern California, and the seed corn maggot was reported causing extensive damage to newly set onions in the latter area.

Aphid populations have thus far been in general light to moderate on cole crops in Florida, Georgia, eastern Virginia, Mississippi, and southern Texas, but were reported late in March as causing moderate to heavy damage in some fields of South Carolina, Alabama, southern Arizona, and southern California. Aphid outbreaks have occurred on spinach in southern California, Arkansas, and Florida, and on potatoes, celery, eggplant, pepper, tomato, and squash in the latter state.

Pea aphids were first observed on market peas at Norfolk, Va., on March 28, at least two weeks earlier than usual. Heavy infestations of this insect have been reported on early peas at Charleston, S. C., while populations are low on market peas in southern California. Heavy populations on alfalfa plus favorable winter conditions indicate a probable pea aphid problem on canning peas in the Blue Mountain area of Washington-Oregon.

The weather during February was warmer than usual except in the extreme Northeast, in northern Minnesota, and the extreme Southwest. The entire month of March was much warmer than usual over the entire area from the Rocky Mountains to the Atlantic Coast. As a result, the 1946 season is from two to three weeks ahead of normal.

# Fertilizer Outlook

**By Kenneth D. Morrison**

AMERICAN farmers have been requested by the Secretary of Agriculture to revise upward their 1946 crop production plans, in order to help in meeting the present critical world wide food shortage. The newer emphasis is on more wheat, corn, soya beans and dry edible beans. With favorable weather, it is expected that the farm output this year will exceed the peak levels of food grown in this country during the past several years.

It is well known that fertilizer consumption is closely correlated with gross farm income. In other words, cash received from the previous year's crops determines very largely the amount of money the American farmer plans to spend for fertilizer in the succeeding year. On this basis, it is fair to assume that the fertilizer consumption for 1945-1946 year should equal if it does not surpass the record for the previous year.

Production and use of fertilizer up to a month or so ago were at record levels. The scarcity of materials was the only limiting factor, and this scarcity in raw materials is world wide. We used to think of raw materials in fertilizer on a domestic basis only. Now, conditions compel us to think in terms of world wide needs. According to a release of the Fertilizer Committee of the Combined Food Board, the world shortage in fertilizer materials for the present crop year is approximately 300,000 tons nitrogen, 500,000 tons $P_2O_5$, 175,000 tons $K_2O$. The total shortages amount to about 13 per cent of the total requirements for the year. Despite this, it is expected that consumption in the United States may exceed the 1945 record of 12½ million tons. The industry is planning to meet the rising trend in consumption by increasing its capacity. Reports are received of new superphosphate plants in the midwest, and of the establishment of a large plant in Florida for the production of elemental phosphorus.

The shortage in nitrogen is proportionately greater than in phosphates and potash. This is due to a large extent to the effect of the recent steel strike, which greatly reduced the quantity of by-product sulfate of ammonia. The reduction came at a critical period when the industry, especially in the south, was getting ready for spring shipments. At the present time, a soft coal strike threatens further to curtail steel operations, which, in turn, again will reduce proportionately the supplies of by-product sulfate of ammonia. The deficit in sulfate of ammonia supplies cannot be made up from nitrogen supplies from other sources. Some manufacturers have been compelled to reduce the amount of nitrogen in their complete fertilizers. This is bound to affect the total yields of important food crops this spring.

Production and deliveries of domestic potash for agricultural purposes reached a record level during the 1945 crop year. As mentioned previously, however, the prospect this year is for a shortage in the total world requirements of potash. The deficit in this essential plant food is due to the fact that European potash mines, particularly those in Germany, have not been restored to full production, and European countries will again be dependent to an extent upon American exports. The chief shortage in potash supplies is expected to be in the form of sulfate of potash. Potash for fertilizers at present is at an all-time record rate. It can be confidently stated that the use of potash for fertilizer purposes would be still higher than at present, were it not for the fact that a shortage in freight cars makes further deliveries difficult.

Even in the case of phosphates, which during the past several years have been produced at record levels, a critical shortage in 1946 may be expected owing to increased demands from foreign countries, especially in Europe, where the production of this essential element has been held back by lack of fuel, raw materials and transportation. We have reports that the production of phosphate rock from Moroccan deposits may be curtailed, which will affect production of superphosphate on the Continent. The capacity in this country for producing superphosphate is ample for our domestic needs. More superphosphate would be manufactured if both phosphate rock and sulfuric acid were available in larger quantities. The shutdown of ordnance plants caused, for a brief period, a scarcity of acid, but other facilities were soon reopened, and a critical situation was averted. Recent strikes at Florida's phosphate mines, plus transportation difficulties, will reduce the supply of rock phosphate at a number of northern production centers.

The fertilizer industry is faced with the problem of government interference with private enterprise. During the past year, several bills were introduced in Congress which have for their purpose the establishment of government-owned potash and phosphate works in the west, with the provision that such factories would ultimately be turned over to farm cooperatives for operation, in direct competition with privately owned plants. Even though American sentiment is generally opposed to such competition with the government of its own citizens, nevertheless, these bills continually harass the industry, and hold up much needed new plant facilities.

•

### New Fertilizer Plant

C. D. Smith Drug Company of Grand Junction, Colo., announces that its new fertilizer plant will be completed soon in that city. The plant is expected to serve the western Colorado area and sections of Utah and New Mexico.

# INDUSTRY NEWS

### Miller Chemical Expands

An additional 8,000 square feet of floor space has been added recently to the 60,000 square feet already occupied by Miller Chemical Co., of Omaha, Neb. The new space will be devoted nearly entirely to the production and packaging of DDT and 2,4-D weed killers for ultimate use on the farms in the Omaha vicinity, according to a company spokesman.

•

### Leonard to U.S.D.A.

Mortimer D. Leonard, in charge of insecticide price controls in O.P.A. for the past four years, is now with the Office of Foreign Plant Quarantines of the U. S. Bureau of Entomology, Department of Plant Quarantine, U.S.D.A. Mr. Leonard's work is in the preparation of information concerning foreign injurious insects likely to be introduced into the U. S. through commerce. His office is in Washington, D.C. For a number of years in the late thirties Mr. Leonard was with John Powell & Company, New York.

•

### Kitchen Heads Fruit Ass'n.

C. W. Kitchen, formerly Assistant Administrator of the Production and Marketing Administration, U. S. Dept. of Agriculture, is now executive vice-president of the United Fresh Fruit and Vegetable Association with headquarters in Washington, D. C. Mr. Kitchen has for a number of years been connected with U.S.D.A. and was lately with the War Food Administration. He is also a member of the Famine Emergency Council, working with the President's Famine Emergency Committee.

The United Fruit Association is a nonprofit service organization, neither producing, owning nor marketing any of the commodities which make up the stock in trade of its members. Rather, it performs services in their behalf, including acting as a clearing-house for ideas and information. To improve retailing methods, the group seeks to promote education in the field, covering such

C. W. Kitchen

matters as purchasing, stock control, spoilage prevention, store arrangement, personnel training and other fundamentals. Three branches of the parent Association work toward improving methods and conditions in their fields. These are the Merchandising Institute, the Potato Division and the Brokers Division. Over-all responsibilities have to do with legislation, transportation, and contact in general with governmental and legislative agencies, both Federal and State.

The Association is in its forty-third year, and has members in every state, the District of Columbia, Canada and Mexico.

•

### Douglass at Minnesota U

R. M. Douglass has rejoined the University of Minnesota extension service after four years in the army from which he was recently discharged with the rank of lieutenant-colonel of heavy corps artillery. His present work is state leader in program planning and coordination with the University extension. Prior to the war he served 13 years in Minnesota as county agent and county agent supervisor.

### Los Angeles Firm Renames

"Eston Chemicals, Inc." is the new name by which the former Pittsberg Chemical Co. of Los Angeles is now known. The firm was recently incorporated under the new designation. No change has been made in the management or general operations of the company. Head officers are A. M. Esberg, president, and G. S. Wheaton, executive vice-president. The company manufactures refrigerants, insecticides, fumigants and other industrial chemicals, and is expanding its operations in all of these fields.

•

### Food Machinery Corp. Elects

Four new vice-presidents of Food Machinery Corp. were elected at a meeting of the Board of Directors held in San Jose, Calif., March 26, according to Paul L. Davies, president of the corporation. The four are J. B. Cary, J. M. Hait, P. C. Wilbur and B. C. Carter. Three of the four electees filled vacancies brought about by the retirement of three former vice-presidents.

•

### Midwest Adds Personnel

Midwest Research Institute, Kansas City, announces personnel additions in a number of its departments. Dr. Max H. Thornton, biochemist, has joined the Midwest technical staff. He was formerly connected with the Purdue University Agricultural Experiment station. Dr. Loren E. Morey has joined Midwest's Agricultural Chemistry Department. He is a specialist in plant biochemistry and a graduate of Columbia University. Another addition to the Institute's Agricultural Chemistry department is John D. Fulton recently discharged from the army. Howard M. Gadberry is now a member of the Midwest Inorganic chemistry department, according to the announcement.

### Commend Orlando Group

Four former members of the Orlando group of the Division of Insects Affecting Man and Animals,

Dr. Walter E. Dove

Bureau of Entomology and Plant Quarantine, U.S.D.A., have been presented with letters of commendation by Adm. Ross T. McIntire, Surgeon General of the U. S. Navy. The four are Dr. W. E. Dove, Howard A. Jones, Lawrence C. McAlister, Jr., and H. O. Schroeder. Special commendation was given to Dr. Dove who served as chief of the Division during the war. Dr. Dove is now chief of the entomological development section, insecticide division of Dodge & Olcott, Inc., New York. The other three are also connected with the entomological development section of the same firm.

The Navy's commendation was in recognition of "exceptionally meritorious service" rendered to the Naval Forces by aiding in "the adoption of new methods and techniques in the control of insect-borne diseases." The men were lauded for having recognized the military potentialities of DDT, insect repellents, miticides and mite repellents, and for working out means of application "which has changed the entire methodology for the control of insect-borne diseases."

•

### Niagara Sprayer Expands

Work is under way at Richmond, Calif., on a new $150,000 chemical plant being constructed by the Niagara Sprayer and Chemical Co., subsidiary of Food Machinery Corp., of San Jose, Calif. First units of the plant will occupy 35,000 square feet of space, according to reports. The plant, when completed, will be used in the production of agricultural chemicals, particularly insecticides and fungicides, for west coast consumers.

•

### Makers of "MCP" Move

Mill Creek Products, manufacturers of insecticides and other agricultural chemicals are now in production at Kansas City where the plant moved early this year from St. Louis. Principal product of the firm is an insecticide, "MCP," containing rotenone and pyrethrum with other ingredients in a volatile liquid. The Mill Creek company was established two years ago in St. Louis by M. M. Bowman and D. S. Seibel. A third partner, George Morris, has since been added to the firm.

•

### Agicide Appoints Carroll

Agicide Laboratories, Inc., Racine, Wis., announces the appointment of Francis E. Carroll as general manager in charge of the company's insecticide division. Mr. Carroll has been in charge of insecticide development for the company since 1936. He is a graduate of the University of Wisconsin, college of Agriculture, and was later affiliated with the U.S.D.A., Bureau of Entomology and Plant Quarantine, Pea Aphid investigations at Madison, Wis.

•

### L. H. Butcher Co. Moves

L. H. Butcher Co., manufacturers of insecticides and an industrial and agricultural chemical supply house, has recently moved to a new location in Los Angeles. The new headquarters, at 3628 East Olympic Blvd., gives the firm considerably larger space.

•

### New AIFA Members

Agricultural Supply Co. of Grand Forks, N. D. and J. R. Watkins Co., Winona, Minn., are new members of the Agricultural Insecticide and Fungicide Association, according to the April AIF News.

### Robert Joyce Dies

Robert F. Joyce of the Orbis Products Corp., New York, died suddenly of a heart attack on April 3 at

Robert F. Joyce

his home in Brooklyn, N. Y. He had become associated with Orbis only on April 1 last having prior to that time been associated with Derris, Inc., New York, since 1938. He joined Orbis to conduct their newly formed insecticide division in conjunction with Robert Wotherspoon of that company. He is survived by his wife and four sons, one of whom is still in the Navy, the other three having recently been released from service, and by his brother, Judge George J. Joyce, a New York City magistrate.

•

### Sunland Expands

A new fertilizer plant is being added to the facilities of Sunland Industries, Inc., Fresno, Calif. The new unit is planned to be in operation next fall. The company states that its fertilizer output will be doubled by the addition.

•

### McGuire Du Pont N. Y. Mgr.

Effective April 1, Edward J. McGuire, New York branch manager of the Grasselli Chemicals department of E. I. du Pont de Nemours & Co., was named New York district sales manager. G. A. Wright has been appointed assistant district sales manager of the New York area. Mr. McGuire, who completes 36 years with Du Pont in June, will continue to make his headquarters at the New York office of the company.

# FEDERAL INSECTICIDE BILL

**First draft revised by 27 changes and becomes H.R. 5645. . . . Registration required only once, instead of annually . . . herbicides added . . . coloring requirements eased.**

ALTHOUGH a total of 27 alterations and deletions have been made in the original new Federal Insecticide Bill (H.R. 4851) in a newly revised draft of the bill (R.H. 5645), the over-all principles of the earlier draft are largely maintained. Provision that a product need be registered only once instead of annually, with re-registration required only when a change is made in label or formula, represents one of the major changes in the revised bill. Another of importance includes the specific addition of weed killers under the provisions of the insecticide act for the first time. This addition has raised little objection inasmuch as several states have recently included herbicides under their economic poison laws.

Rodenticides are placed in the same category as insecticides, fungicides and weed killers under the provisions of the new bill. Regulations governing the coloring of economic poisons are eased somewhat by H.R. 5645 which grants the Secretary of Agriculture the authority to exempt from the compulsory coloring requirement any economic poison for a specific use or uses where coloring "is not necessary for the protection of the public health."

Foreign purchasers of economic poisons are responsible for observing the laws of their countries rather than the American manufacturer under the new bill. The former bill required the manufacturer to know the laws of foreign countries before exporting economic poisons.

Shipping of experimental material without a permit is allowable under the new bill, providing the material is for use by or under the supervision of any Federal or State agency authorized by law to conduct research in the field of economic poisons. This does not mean that the permit system is abolished, however. It is still retained for shipment of experimental material to others.

The Secretary of Agriculture is authorized to grant extension of the effective date of sections of the bill covering prohibited acts, penalties, seizures and imports for a particular economic poison, providing application for such extension is received within one year after these sections of the bill become applicable. The Secretary is to determine first whether such action will be detrimental to public interest, or if refusal will work a hardship on the manufacturer. The Secretary is also authorized under the new bill to cooperate with the official agricultural regulatory agency of a state in securing uniformity of regulation as well as in carrying out the provisions of the act.

Other changes appearing in the bill are in accord with certain recommendations made by the industry and agricultural groups in an effort to clarify the intent of the act in its entirety.

•

### Dr. Howard B.A.I.C. Chief

Dr. L. B. Howard, formerly assistant chief of the Bureau of Agricultural and Industrial Chemistry is now in charge of that bureau following the resignation March 31 of Dr. O. E. May who had been associated with the bureau for the past 23 years. Dr. Howard has been with the bureau for the past 14 years. He was assistant to Dr. May at the Northern Regional Research Laboratory, and was later head of the Commodity By-products Division of the Western Regional Research Laboratory at Albany, California. He became assistant chief of the bureau last November. Dr. May is leaving the Department of Agriculture to become associated with the Coca-Cola Co. in an executive capacity.

•

### N. J. Mosquito Assn. Meets

The New Jersey Mosquito Extermination Association held its 33rd annual meeting April 3, 4 and 5 at Atlantic City. The program included presentation of information and discussions relating to research and control of mosquitoes and safe application of insecticides for their control.

•

### Pest Control in Cannery

Food canning companies have come to realize that it is "good business" to help control insects which infest their growers' crops, observes James McConnon, vice president of McConnon & Co., Winona, Minn. in an article in the March, 1946 issue of the *Food Packer*. Mr. McConnon explains the methods used in controlling the Pea Aphid, cabbage insects, pests which infest cucumber and pumpkin crops, as well as beans and corn. He points out that canners, with larger equipment and buying power, can deal with pests to better advantage than can individual growers most of whom furnish vegetables on a contract basis. Trained field men and other workers utilized by canners can provide information as to the proper insecticide to use for a particular problem, as well as providing checks of insect population, maturity of the crop, weather conditions, the presence of insect predators and disease and other conditions having a bearing on the operation.

Mr. McConnon describes in detail methods used under various field conditions and the type of insecticide applied in each case.

•

### Sanders Joins Com. Solvents

James G. Sanders, entomologist, has joined Commercial Solvents Corp., at their New York office. Mr. Sanders will work closely with the agricultural division of the company in developing markets for insecticides, fumigants, etc.

### N. Y. Flower Show Attracts

Manufacturers and distributors of various agricultural chemicals exhibited their products and distributed literature to thousands of potential consumers at the International Flower Show in New York City in March. Firms handling insecticides, fungicides, fertilizers, weed killers as well as various types of hand and power sprayers displayed their wares in booths.

Among such exhibitors were Doggett Pfeil Co., Springfield, N. J., makers of agricultural chemicals; Atkins and Durbrow, Inc. of New York, fertilizers; Agricultural Laboratories, Columbus, O., showing compost developers, plant-stimulating tablets and insecticide; O. E. Linck Co., Montclair, N. J., insecticides; B. G. Pratt Co., Hackensack, N. J., sprays; Andrew Wilson, Inc., Springfield, N. J., insecticides and fungicides; Nott Mfg. Co., Mt. Vernon, N. Y., rodenticides; and American Chemical Paint Co., Ambler, Pa., weed killers.

•

### Martin L. Davey Dies

Martin L. Davey, 61, who as a business man headed the Davey Tree Expert Company, and in public life was two times governor of Ohio, died at his home in Kent, Ohio, March 31. Mr. Davey's career in the tree surgery and custom spraying field began in 1907 at which time he became general manager of the company which still bears his name. The firm expanded under his leadership, and by 1928 had branches in seventy American cities. Aside from his horticultural interests, Mr. Davey had an active political career which included mayorship of Kent, nine years in Congress, and two terms as governor of Ohio.

•

### Vaccine For Rinderpest

Secretary of War Robert P. Patterson, in a recent discourse before the American Chemical Society told the group that this country's preparation against chemical warfare has led to a number of scientific discoveries applicable to agriculture. He mentioned development of a vaccine for rinderpest, one of the most serious diseases among cattle in the Orient, and said that quantities of this vaccine are being turned over to the Chinese government through UNRRA for protection of livestock.

•

### Name New Sales Managers

J. G. Brunton

J. F. Francis

Pennsylvania Salt Manufacturing Company has named J. G. Brunton eastern sales manager and J. F. Francis western sales manager of its Agricultural Chemicals Division. Heretofore, each man had been serving as assistant sales manager in the respective territories. Mr. Brunton, a graduate entomologist of the University of California, joined the company in 1939. Mr. Francis, a graduate entomologist of the same school, joined Penn Salt in 1943.

•

### Niagara Sprayer Merges

Niagara Sprayer and Chemical Co., Inc. of Middleport, N. Y., on February 1, 1946, became a division of Food Machinery Corporation. The former company now operates under the name, "Niagara Sprayer and Chemical Division, Food Machinery Corporation."

•

### Dicalite Co. Expands

Dicalite Co. of Los Angeles has announced the opening of one new district office and the appointment of a new manager in two other districts. The Detroit district will be managed by I. J. Snider who is located in offices in the Maccabees Building there. In the Cleveland district Gordon C. Halvorsen has been appointed manager to succeed H. L. Dunham, who was appointed to the Eastern division as manager in 1945. Chester C. Minier was named manager of the San Francisco district office now located at 112 Pine Street.

### Tritox Changes Formula

For the purpose of controlling early and late blight on tomatoes and potatoes, the Tritox Chemical Co. of Washington, Ind. has recently added yellow cuprocide, the standard cuprous oxide fungicide to the formula for its insecticide. The addition of copper to the formula makes in one mixture a complete insecticide and fungicide for dusting or spraying garden and field crops, according to S. H. Burton, manager of the Tritox Co. The J. W. Graves Hardware Co. of Indianapolis has been appointed sales representative for that territory. The Tritox Company manufactures agricultural and garden insecticides.

•

### Fertilizer Use Increases

Although the use of lime and fertilizers by American farmers is currently at the highest rate in history, consumption would be still greater if more of these materials were available, according to the 1945 annual report of Clinton P. Anderson, United States Secretary of Agriculture. Under economic conditions not greatly different from those obtaining in 1943, the report indicates that it would pay most farmers to use considerably increased quantities. Mr. Anderson states that under such conditions, it would pay farmers to use about double the amount of fertilizer they used in 1944, or about four times the average consumption in the prewar years of 1935-39. In liming materials it would pay them, under the assumed favorable conditions, to use nearly three times as much as they did in 1944.

•

### Advertise on West Coast

Ad Fried Advertising Agency, Oakland, Calif. is handling the accounts of Rainbow Hybridizing Gardens, Placerville, Calif.; Agriform Co., Santa Ana; and Home Supply Co., Oakland. Rainbow Hybridizing Gardens is using ten national home and gardens magazines for its advertising medium, while the initial campaign for Home Supply will include San Francisco and Oakland newspapers, with radio programs later.

# California Liberalizes DDT Labels

LATEST California regulations governing the "Labeling of Economic Poisons Containing DDT" were issued in the form of a bulletin (EP-50) by the California State Department of Agriculture, Bureau of Chemistry, March 4, 1946. The new bulletin supersedes No. EP-48 which was issued last year covering the same subject shortly after the release of DDT for civilian use.

Principal change in the California rules is the raising of the DDT content in a product from 1 per cent to 5 per cent before an official poison label is required. In last year's bulletin (EP-48), the Bureau of Chemistry stated that products containing as much as 1 per cent DDT must carry a poison label in California. This limit has now been raised to 5 per cent, the move being indicative of progress in research into the subject of DDT toxicity. The California State Board of Pharmacy which administers the poison law requires for insecticides containing more than 5 per cent DDT, the word "Poison" and the skull and crossbones printed in red on white background, or vice versa, to appear on the front or main panel of the label. If the antidote is not also given on this panel, the word "Poison" and the skull and crossbones should be given again where the antidote does appear. The official antidote, to be given on labels of products containing more than 5 per cent DDT, is as follows:

ANTIDOTE — Remove from further contact. If swallowed, give a tablespoonful of soap, baking soda or salt in a glass of warm water and repeat until vomit fluid is clear. CALL A PHYSICIAN.

Properly informative labeling in California of insecticides containing DDT should provide the percentage of each separate active ingredient, according to the bulletin. The preferred statement of ingredients, it says, gives separately the percentage of the para para isomer (1-trichloro-2,2-bis (p-chlorophenyl)-ethane) and the other isomers of DDT. Products bearing a statement of ingredients on the label in terms of "Dichlorodiphenyl - trichloroethane (setting point 89° C.)," for the present are being accepted in California for registration provided the separate percentages of the para para isomer of DDT and of the other isomers are given in the statement of ingredients in the application for registration.

### Pests to Be Controlled

California regulatory officials rule that in that state an economic poison can be sold legally only for control of the pests listed with the application for registration or on the accepted label. Economic poisons containing DDT have been accepted for registration in California for control of certain pests as follows:

Thrips on garlic and on onions raised for seed or for dry onions.

Thrips, leafrollers, and tussock moth larvae on pear trees before fruit is formed or on these fruits when adequate means of spray residue removal are available.

Codling moth on apples and pears, provided labels bear adequate warning that it may be necessary to remove spray residue at harvest time.

Thrips, cankerworms, leafrollers and tent caterpillars on prune trees before fruit is formed or on such fruit when any excess spray residue is to be removed.

Thrips on nectarine and peach trees before fruit is formed.

Grape leafhoppers on grapevines before grapes are formed.

Flea beetles on potato vines.

Thrips and lygus bugs on cotton.

Thrips, lygus bugs, and alfalfa caterpillars on alfalfa grown for seed.

Citrus thrips and citricola scale on navel orange trees at petalfall time. (Present information indicates DDT should not be applied to citrus fruit.)

Flies, mosquitoes, bedbugs, fleas, and similar pests in households, barns, stores, restaurants and other establishments.

Registrations are not accepted in California for the use of DDT on leafy vegetables intended for human food or animal feed according to the bulletin. They point out that "no adequate commercial cleaning methods have been devised for removing DDT residues from leafy vegetables" and state further that the dilute hydrochloric acid wash commonly used for removal of arsenical and fluorine spray residues from apples and pears is not effective for removal of DDT residues.

Copies of this bulletin, No. EP-50 may be secured by writing the State of California Dept. of Agriculture, Bureau of Chemistry, Sacramento, Calif.

•

### Arkansas Firm Incorporates

Articles of incorporation have been filed with the Arkansas Secretary of State at Little Rock for the formation of a new firm, RRC-32, Inc., which will deal in insect repellents and plant disease controls. Incorporators are John O. Wilson resident agent, and W. F. Daniels, both of St. Joe, and J. Smith Henley of Harrison. The new corporation, listing the sum of $100,000 as authorized capital stock, will operate in St. Joe, Searcy county, Ark.

•

### Piller Back to Wisconsin

After three years' service in the U. S. Navy, Lt. Alvin L. Piller is back with the Wisconsin Department of Agriculture. His current assignment is to work with cranberry growers in solving problems relating to plant disease and insects. Prior to his entering the service in 1943, Mr. Piller had 12 years of experience in corn-borer control, nursery inspection, transit inspection and grasshopper control in Wisconsin.

•

### Ethyl Corp. Names Krieger

Ethyl Corporation, New York, has named George Krieger chairman of the Agricultural Development Committee of the American Petroleum Institute. The committee plans to make studies of farm mechanization, farm-oil plastics and chemicals, soil conservation, maintenance of fertility and the use of insecticides, fungicides and weed destroyers. The new chairman has been in charge of farm research for Ethyl Corp. since 1930.

## TRADE MARKS GRANTED

(*Continued from Page* 45)

Bartlesville. Okla. Filed April 13, 1944.

420,135. CHEMICAL FOR INSECTICIDAL USES. Hercules Powder Co., Wilmington. Del. Filed August 18, 1945.

420,202. CHEMICAL PREPARATIONS FOR EXTERMINATING WEEDS. American Chemical Paint Co., Ambler, Pa. Filed Sept. 14, 1944.

420,287. INSECTIDES; NAMELY, INSECTIDAL HOG OILS. Puritan Laboratories, Inc., Des Moines, Ia. Filed Sept. 6, 1945.

•

### Plant for Pacific Supply

Pacific Supply Cooperative is now operating in its new Portland, Ore., plant manufacturing rotenone, DDT, copper and other insecticidal dusts for crop protection. The new chemicals division plant is 200 x 260 feet, and contains space for 3,000 tons of bulk fertilizers and for 12,000 to 15,000 tons of sacked materials. In addition to its own manufacturing program, it jobs other products used by farmers. All types of fertilizers will be mixed for the production of agricultural crops in Oregon, Washington and Idaho.

The ownership of Pacific Supply is cooperative, with approximately 125 persons participating. The organization is a member of National Cooperatives, according to J. B. Stanley, manager of the chemicals division.

•

### Orange Decay Controls

J. F. L. Childs and E. A. Seiglar of the U. S. Department of Agriculture, describe in *Industrial and Engineering Chemistry* (Vol. 38, No. 1, Page 82) methods of controlling orange decay with thiourea, thioacetamide, 2-aminothiazole and quinosol in aqueous solution. Thiourea and thioacetamide in 5 per cent and quinosol in 8 per cent aqueous solution decreased decay of Florida orange fruits, caused by stem-end rot and the blue and green molds, from approximately 40 to 2 per cent or less, when applied as a momentary dip. Control with 5 per cent solution of 2-aminothiazole, was not consistent. Five per cent of thiourea or of thioacetamide was equally effective in commercial trials when incorporated in the water phase of wax emulsions used on fruit. Similarly 5 per cent solution of quinosol or of thiourea gave excellent control when applied to the fruit prior to waxing by the solvent-wax process.

Penetration of the fruit tissues by these compounds is closely associated with their effective action, and the presence of thiourea in the tissues of treated fruit was shown. In the case of thiourea and thioacetamide, the presence of both sulfur and amino groups in the molecule appears essential to effective action when applied as a dip.

•

### Hormones Boost Egg Output

Dr. C. W. Turner and associates of the Missouri Agricultural Experiment Station at Columbia report sustained egg production during the months of May, June, July and August through feeding thyroprotein to White Leghorn hens in their third laying season. During these summer months the hormone-fed hens produced at a rate of 36.3 per cent compared to 23.6 per cent for control birds not receiving the hormone. Similar results were obtained with Rhode Island Red pullets, with the thyroprotein-fed hens producing at the rate of 67.2 per cent against 52.7 per cent for control fowl, through the May-September period.

These results were obtained with 10 gm. of thyroprotein per 100 lbs. of feed, a proportion shown to be more satisfactory than 5 gm. or 20 gm. per 100 lbs. of feed. One group of Rhode Island Reds in the experiment produced no more than controls during the summer after receiving 20 gm. per 100 lbs. of feed. Although there are indications that such a diet tends to reduce the decline in egg production common with age, the authors are keeping their birds on the diet awaiting further evidence.

### Hop-Borer Control

A number of methods for controlling the hop-vine borer, major insect pest of hops in New York state, are described in a recent bulletin from the experiment station at Geneva, N. Y. One method is to destroy the grasses on which the eggs are laid before hatching time in early May. At that time the larvae usually begin entering the hop vines and by the first week in June most of the larvae have found their way to the hop plants and begin feeding on the base of the vines just below ground. Destruction of the grasses (quack grass and green fox-tail) are said to be most certain and least expensive.

Another method makes use of an emulsion of dichlorethyl ether which is put on the soil around the vines. This material acts as a fumigant, says the bulletin, and should be applied to the entire yard at one time for best results. Tests have also been made with DDT applied to the soil before the eggs hatch, according to the report. Although this method shows promise, the bulletin says, further checking is necessary before definite conclusions may be drawn.

•

### Bindweed Killer

Killing bindweed with treatments of 2,4,5 trichlorophenoxyacetic acid is indicated as being practical from preliminary observations in this field. Development of growing points of bindweed were not only stopped but also browned and killed at concentrations of 1,000 ppm, 500 ppm and 100 ppm prepared with Carbowax 1500, according to Charles L. Hamner and H. B. Tukey of the New York Agricultural Experiment station, Geneva. Killing by use of growth-regulating substances is cited by the authors as being particularly significant in plants such as bindweed which is deeply rooted and which regenerates readily not only from seed but also from shoots arising from underground stems and roots. In using this chemical not only the foliage is destroyed but also portions of the plant are affected at some distance from the point of application, according to the bulletin.

## LIVESTOCK INSECT CONTROL

(*Continued from Page 29*)

mals, the biting lice feeding upon scales of the skin and hair, the sheep ticks feeding upon the skin and blood, and the mites developing within the skin are all obligatory parasites. They cannot live for long periods if they are removed from the host animal. They have specific hosts and cannot maintain themselves on other kinds of animals. This means that the parasite can be eliminated on cattle, or other animals by simply treating the particular kind that is infested.

Dusts may be used for destruction of both kinds of lice, also for sheep ticks, but they do not lend themselves to complete coverage of the animal like dips and sprays. Mites can be controlled or eradicated with suitable dips if the animals are treated at the proper intervals to insure destruction of the newly hatched larvae. When animals are dipped they should be completely submerged for a complete coverage of the animal. If there is any danger of chilling the animal during the dipping, the stockman is inclined to dust the animal. Either method will reduce the parasite population.

House flies and eye gnats are annoying to animals even though they are not capable of biting them. Both kinds lay eggs and develop in filth or in soil saturated with filth. Both kinds crawl about the eyes and mouth of animals and into wounds, other injuries, or natural openings of the body. They are able to transmit bacterial infections, and house flies commonly transmit a common nematode of ruminants known as *Habronema*. These worms live in the lumen of the intestines and in the intestinal walls and are not easily removed by internal medication. Pink eye and other infections can be transmitted to animals by house flies and eye gnats. Eye gnats are often responsible for conjunctivitis among school children in certain sections of this country. Both house flies and eye gnats may be kept away from man or animals for several hours by suitable repellents, also surface sprays applied to glass windows will greatly reduce their numbers.

### Types of Insecticides

THE insecticides that are needed for combating the five tentative groups of insects and other external parasites of livestock may also be classified into three general types according to the methods of application.

1. The flies that visit animals for the purpose of obtaining meals of blood, also the visiting flies that do not bite animals, may be killed by timely applications of suitable surface sprays to the hair of animals. Some species of horse flies, deer flies, and the "dog flies" that are difficult to kill in this manner can be kept away from the animals with good repellents that are properly applied.

2. Flies that lay eggs upon animals offer problems primarily for larvicides that can be applied into wounds for screwworms, in infested wool for maggots, or in grub cysts for killing cattle grubs. These problems vary according to the species of fly larvae concerned, and require specific treatments for the different pests.

3. Lice that remain on animals and lay eggs, mites that remain and develop in the skin, and ticks that attach to the skin for blood but drop to the soil for laying eggs, are most effectively controlled by the dipping of the animals in an insecticidal solution or suspension. If the dip does not include an ovicide for destroying the eggs of lice, it should be used at the proper intervals to insure control of both cattle lice and cattle grubs. Sprays and dusts may be used instead of dips, if the necessary intervals are observed between treatments.

Mites in the skin or "mange mites" require special treatments. Since they are not widely distributed like lice or grubs, they should be eradicated in the localized areas.

The uses of insecticides on livestock include not only the proper selection of the toxicant, but its proper formulation, its timely application, the use of good equipment for proper coverage, and the utilization of competent labor for an efficient application. Along with the efficiency of the treatment is a matter of greater importance, that of the safety of the insecticide. The health of the animal, the health of the operator, the prevention of contamination of foods by dead insects, the absence of odors that affect taste of foods made from animals or animal products, and freedom from any possibility of poisoning man or animals, are of first importance. Because of this, the insecticide should be made a safe one.

It still is necessary to caution the user to avoid eating, breathing, drinking or absorbing such insecticides as can affect the health of man or animal. While such precautions will continue to be necessary as long as some of the problems require the use of materials having toxicological hazards, it will be recognized that none of the insect problems affecting man or animals can be said to be satisfactorily solved until they can be handled effectively and economically with completely safe materials involving no hazards. In the meantime it may be said that there is little excuse for the use of materials that are or may be dangerous if safer materials are available to accomplish the same purposes.★★

## 2,4-D WEED KILLER

(*Continued from Page 22*)

with bindweed," he says, "causing farmers to leave and costing banks thousands of dollars in lost equities, not to mention the loss of food production. Preparations such as sodium chlorate have not been entirely satisfactory because of injury to the soil, the relatively heavy cost, and the fact that two or three seasons are often required to gain control of the pests. With 2,4-D, however, it is hoped that the job can be done in about half of the former time, at about half of the former cost, and without injury to the soil.★★

•

### Join Rubber Co. Station

Dr. H. D. Tate, entomologist, and Dr. T. W. Brasfield, plant pathologist, have joined U. S. Rubber Co. agricultural experiment station, Bethany, Conn.

# HANDBOOK OF PEST CONTROL

The Behavior, Life History and Control
of Household Pests

*By* ARNOLD MALLIS

THIS new book is a thoroughly practical, complete and up-to-date study of pest control which will be invaluable to every insecticide manufacturer, pest control operator and entomologist. Approximately 570 pages in length, and containing 140 illustrations, it deals in a practical way with the behavior, life history and control of household pests.

While there have been other books in this field, Mr. Mallis' book is by far the most complete and up-to-the-minute practical text on the subject. It reflects insecticide developments as recent as those of the past few months, carrying for instance, the most recent findings on DDT, aerosol insecticides, insect repellents, etc. The emphasis throughout is on control measures, and the author covers fully all the commonly used insecticide materials and treatments. Fumigation is the subject of a special chapter.

An unusually complete list of references to the literature on household pests, insecticides and their use adds considerably to the value of Mr. Mallis' new book. Hundreds of references to the technical literature are listed.

TABLE OF CONTENTS



HANDBOOK OF PEST CONTROL has standard high-grade book binding, cloth and board covers, 6 x 9. Priced at $6.25 per copy ($6.50 outside the U. S.). Check *must accompany* order. Orders for books to be sent on approval *cannot be accepted,* but the usual return privilege will be accorded where copies are returned unmarred within 10 days. Owing to present conditions, the first edition must be limited. Accordingly, an *early order* accompanied by check is suggested.

*Published by*

**MAC NAIR-DORLAND CO.**

254 West 31st Street New York 1, N. Y.

Mac Nair-Dorland Co.

Enclosed is check for $6.25 ($6.50 foreign). Send me a copy of the new "Hand Book of Pest Control."

Name .....

Firm .....

Address .....

# Raw Material Markets . .

A SOMEWHAT more encouraging picture is currently reported in the market outlook for agricultural insecticide raw materials. A new agreement has just been negotiated with the Peruvian Government (see pg. 27) to ensure shipment to the United States of the entire Peruvian exportable surplus of rotenone bearing root for the coming year. However, supplies cannot of course arrive in time to relieve the immediate serious shortage which will continue to be felt for the next few months at least, during the heaviest consuming period.

Encouragement is noted in the pyrethrum picture, with the reported arrival of 1,700 bales of pyrethrum flowers from Kenya, British East Africa, the first high test flowers to be assigned to private importers since the beginning of the war. The U. S. Bureau of Foreign & Domestic Commerce reports that imports of pyrethrum into the United States during 1945 were 18,270,000 lbs., the highest total for any year since 1937 when imports totaled about 20,000,000 lbs.

There seems currently to be an adequate supply of arsenicals to meet normal demand. Domestic production of arsenic during the fourth quarter was 22 per cent below the preceding quarter, but increased imports during the fourth quarter more than made up the deficit. December production of lead arsenate was 5,514,000 lbs., a rise of a million and a quarter pounds over November. Total production of lead arsenate for the year was 71,192,000 lbs., 20 per cent less than 1944 output.

With a U. S. Department of Agriculture decision to divert 5 million pounds of burley tobacco for nicotine manufacture, hope for at least partial relief in the critical shortage of nicotine insecticides is seen by the industry. The diversion is expected to make up to 250,000 pounds of nicotine sulfate available by the end of July. This would bring the total spring supply up to 80 per cent of the amount available last year. Through a cooperative agreement with the Federal Government, manufacturers will allocate the still short supply on the basis of local needs. This plan, according to manufacturers, will make it possible to keep the price of nicotine unchanged. The new decision means a resumption of U. S. Department of Agriculture buying which stopped last year because of cost and a shortage of tobacco leaf. Production of nicotine in 1945 ran about 9 per cent below the 1944 output.

Production of copper sulfate reached an all-time high of 250,000,000 lbs. in 1945, 22 per cent above 1944. Although rate of output since the first year has declined, due to a strike at one of the plants, no supply problem is expected to result as demand is normally light at this season of the year.

Production of DDT during the final quarter of 1945 ran to approximately 9,500,000 lbs., with total output for the year bulking some 20,000,000 lbs. above 1944 production. The supply situation is reported good, and increasing output seems to promise that the 1946 demand can be met.

•

### Fertilizer Supply Short

According to reports received recently by the U. S. Department of Agriculture from the Combined Food Board, serious shortages of commercial fertilizers for world food production are in prospect for this growing season. The over-all world shortage of plant foods exclusive of needs in the Far East was estimated by the committee on fertilizers of the Food Board at approximately 1,000,000 short tons.

The U. S. Department of Agriculture stated recently that while a tight supply situation will exist in the United States this year, available supplies of fertilizer should be sufficient to maintain high-level food production. Prospect supplies of fertilizer available to American farmers are as follows: Nitrogen, about the same total as a year ago with substantially less Chilean nitrate of soda, but more domestic synthetic nitrogen. Total potash supply, about the same as last year, but with less in sulfate form. Phosphate supplies, somewhat more than a year ago with the increase coming mainly in the form of ordinary super-phosphates.★★

### DDT IN AGRICULTURE

(*Continued from Page* 27)

they will have considerable use; however here there is considerable confusion. Available information indicates that the volume use in this field will not be comparable with that of the insecticides they will in part replace. They will replace in part lead arsenate and cryolite and some uses of nicotine insecticides, but not markedly impinge on the average quantity of nicotine alkaloid used in this general field.

9. In some fields their use will be followed by increased populations of some species of aphids and mites, which will stimulate the use of aphidicides, such as nicotine, and miticides of various kinds.
10. For some purposes their use will be less detrimental to honeybees than are arsenicals, and as this becomes better recognized quantities of arsenicals used to control some of the truck crop and fruit pests may be curtailed.
11. In some fields, especially in the control of pests of fruits, their use may be so destructive to beneficial insects that community opinion will prevent their general use.

Whatever the final use pattern of DDT insecticides may be, it is not believed that they will supplant any of the standard insecticides. For many purposes they will set new standards of performance which should have a beneficial effect on pest control. It also appears that the stimulus of their reported usefulness will result in the rapid development and production of effective competing insecticides. The fields where the usefulness of DDT insecticides has already been established may soon be contested and high volume production may be maintained only for a relatively short time.★★

# New Books . . .

PYRETHRUM FLOWERS — SUPPLEMENT 1936-1945—By C. B. Gadinger. 320 pages. 28 illustrations. Since the appearance of the author's two previous books, the first and second editions of "Pyrethrum Flowers" (Sept. 1935 and April, 1936, respectively) there has been a complete change in the world sources of pyrethrum. Pyrethrum supply now comes from Kenya rather than from Japan. In addition, there has also been a considerable refinement in the technique of preparing pyrethrum for insecticidal use, and more highly refined and toxic concentrates have been developed. There has likewise been a considerable expansion in the manufacture of pyrethrum insecticides and the development of specialized products. All of this gives the author ample ground to cover in bringing the pyrethrum story up-to-date. For the convenience of owners of the first and second editions the material in this supplement follows along in the same order and pagination is continuous with the second edition. More than 1,300 new references to the recent literature are included. The book would seem to be required reading for every insecticide manufacturer.

•

FUNGICIDES AND THEIR ACTION —By James G. Horsfall, Ph.D., chief Department of Plant Pathology and Botany, Connecticut Agricultural Experiment Station. 240 pages, 19 illustrations. $5.00.

Dr. Horsfall discusses the current trend away from copper and sulphur, former standbys of the fungicide field. He calls attention to the newer direction taken by selective products which give specific control against particular parasites, rather than tending to damage both host and parasite. Old and new types of products are discussed with the mode of operation of each product being pointed out. This book is the second volume in a new monograph series of which Garrett's "Root Disease Fungi" was the first volume.

•

## New Tree Paint Announced

A. C. Horn Company, Inc., of New York announces the development of a tree paint made of plasticized asphalts, resin and lanolin, and fungicidal preventatives consisting of Pinene, bornyl acetate and sylvestrenes. The new paint is now being produced in commercial quantities by the Horn Company.

•

## N. C. Firm Changes Name

Now operating under the name of "Thomas Pest Control Laboratory," the former Thomas Rotobac Co. of Chadbourn, N. C. in addition to handling a general line of insecticides, is now engaging in pest control activities.

# Classified Advertising

**Rates for classified advertisements are ten cents per word, $2.00 minimum, except those of individuals seeking employment, where the rate is five cents per word, $1.00 minimum. Address all replies to Classified Advertisements with Box Number, care of Agricultural Chemicals, 254 W. 31st St., New York 1. Closing date: 1st of month.**

**Assistant Sales Manager** — Large Eastern agricultural and household insecticide concentrate manufacturer has unusual opening for experienced sales assistant, age 30-40, preferably with entomological background. Location New York with regular field trips. Permanent connection and attractive salary to man with superior qualifications. Reply in confidence giving age, education, small photograph and full details of experience. Address Box 101, care of *Agricultural Chemicals*.

**Chemist** — Man with ten-year background in practical insecticide chemistry and three years with Army in DDT formulation and use, desires position in industry. For further details, communicate with Box No. 102, care of *Agricultural Chemicals*.

**Distributor** wants sales rights for State of Missouri on exclusive basis. State covered by our salesmen. All types of chemical, insecticide and allied products considered. Give details to Box 103, care of *Agricultural Chemicals*.

**Will Buy**—Used packaging machine for powders, preferably Pneumatic machine. Also will buy one or more used dry mixing machine units. Give details of type, condition, price, etc., to Box 104, care *Agricultural Chemicals*.

**Information** and news of Agricultural Chemical field is yours every month with a subscription to this magazine. One yr. $3; two yrs. $5. Use the handy bound-in envelope form found elsewhere in this issue of *Agricultural Chemicals*. No postage required if mailed in the United States.

•

### Societies in Meeting

St. Louis, Mo. was the site of annual meetings of three societies the week of March 25. The American Phytopathological Society, Entomological Society of America, and the North Central States Entomologists Association were the groups represented.

### Free Advts. for Veterans

As a service to veterans seeking jobs in the agricultural chemical field, this magazine will accept, without charge, classified advertising from World War II veterans seeking positions. Advertisements should reach us before the first of the month of publication, and should include all essential information, such as experience, skill, age, type of work sought and location desired. Address Agricultural Chemicals, 254 West 31st St., New York 1, N. Y.

### DDT vs Lead Arsenate

Experiments made at the University of Wisconsin last year in controlling the codling moth showed DDT in a favorable light compared to lead arsenate, according to a recent bulletin. Experiments were carried on in a number of counties where comparisons were made between yields of apples from trees treated with DDT and lead arsenate, respectively. Although DDT was superior for codling moth control, many apple growers may find it advantageous to include both insecticides in late sprays, the report says, because of DDT's questionable effect on the control of apple maggots on which lead arsenate is effective. In summary, the Wisconsin Station advises growers not to rely heavily on DDT as yet because of the possibility of increased damage from red mite and apple maggot. It will be wise to try DDT only on parts of orchards rather than entire plantings in 1946, it concludes.

•

### Vermont Weed Control

A study of chemical weed killers has been under way at Vermont Agricultural Experiment Station, Burlington, Vt., to determine the most favorable concentration and time of application for killing pasture weeds. Two pasture weeds, hardtack and shrubby cinquefoil, were selected and one-acre field plots were established in Jericho, Mt. Holly and Arlington.

Of four different chemicals tested during the 1945 growing season, according to a progress report in the Station's annual report for last year, ammonium sulfamate proved the most effective. A concentration of one-half lb. of ammonium sulfamate in one-half gallon of water per 100 sq. ft. applied just previous to or during the early bloom period, was found to give the highest percentage of kill the bulletin says.

The project is sponsored by the Vermont Industrial Agricultural Products Commission, E. I. DuPont de Nemours & Co., and the Experiment Station. Hardtack and shrubby cinquefoil weeds cover over 500,000 acres of pasture land in the state, about 200,000 acres of which are said to be worth improving by the removal of weeds.

•

### Nitric Oxide Production

An efficient, simple and inexpensive method for producing nitric oxide, basis of nitrate fertilizers, has been developed at the University of Wisconsin. This process for nitrogen fixation was developed under the direction of Dr. Farrington Daniels. Toughest problem in nitrogen research is reaching and maintaining temperature of 4,200 degree Fahrenheit at which point the nitrogen and oxygen, both present in the atmosphere, unite to form nitric oxide. Further, in order to keep the two gases combined, they must be cooled almost instantly to at least 2,800 degrees (F.). The new process blows large quantities of air through a hot bed of refractory pebbles, then through an extremely hot gas-fired furnace, and finally through a second pebble-bed where the gas is chilled rapidly and the heat released and stored for use in pre-heating the incoming air when the flow is reversed. By pre-heating, the flame temperature of the gas reaches 4,200 degrees and two other objectives are accomplished: one bed of the furnace is cooled and the opposite one is heated. Thus, by periodically reversing the stream of air it is possible to heat the nitrogen and oxygen to the temperature at which they will combine and almost immediately chill the resulting nitric oxide to prevent decomposition. It is estimated that the Wisconsin process, with six plants, could produce all the fertilizer currently being used in the state.

### DDT Residues Dangerous?

H. F. Wilson, of the Department of Economic Entomology, University of Wisconsin discusses in March *Food Packer* the question of whether DDT residues are dangerous to human beings when eaten with food. He writes that DDT fed to laboratory animals in "comparable concentrations" is probably "not as dangerous a poison as the arsenical and fluorine compounds now in common use for insect control," and states further that "there is probably no danger whatever from eating food treated with the concentrations of DDT — necessary to control insects on food crops. It is very doubtful if enough DDT will remain on silage or forage crops at the time of harvest to poison meat or milk animals."

However, he adds that there is danger of public apprehension "until research definitely establishes the limits of DDT danger to human life," and in this connection cites various tests made on laboratory animals in which in some cases DDT poison was transmitted to the sucking young after the mother had been given food containing DDT. "Most mothers are going to be reluctant to feed their babies on milk from cows fed on DDT-treated crops until approved by the local health authorities," he says and comments further that this fear can also develop in the mind of health officers so much that they might prohibit shipments of milk from areas where DDT is known to be used on forage or silage crops. "The burden of furnishing contrary evidence lies with the insecticide manufacturer . . . and various research departments," he says.

# ADVERTISERS' INDEX



*(The Advertisers' Index has been carefully checked but no responsibility can be assumed for any omission.)*

## TALE ENDS

EASTERN central Illinois farmers believe they have scored a point on the weather man this spring. On a soggy field that would not permit wheeled vehicles or even foot traffic without packing badly, an airplane in a short time sowed some 800 acres of sweet clover to solve the weather problem element in early seeding. The plane was equipped with a 700-pound bin in its front cockpit, and carried devices to distribute the seed evenly in 40-foot swaths.

Advantages for this type of sowing, as pointed out by the farmers involved, include that of early planting in February or March before conventional seeders can get into the fields. The cost was around 60¢ per acre, they reported, and added that they expect it to be reduced to 50¢ when more experience has been gained.

•

Press reports tell of the recent use of 2,4-D on the lawn of the White House in Washington to kill a growth of wild onion which had developed on the grounds. The Government Park Service which applied the weed killer, reports that a thorough job was done without harming the grass.

•

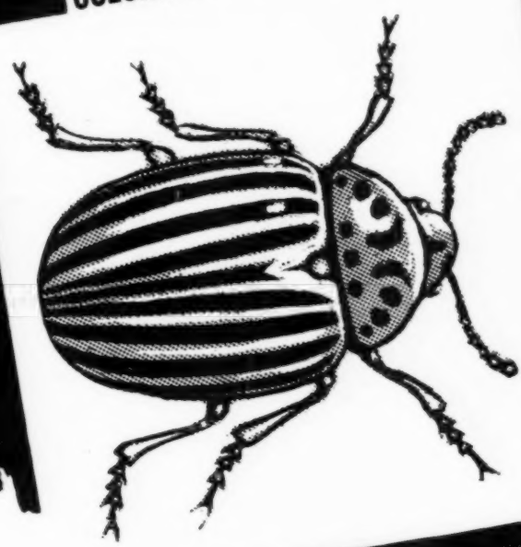
Our readers are asked not to proof read too carefully the legislative chart used as a background illustration with the article by Lea S. Hitchner (Pg. 33) The AIF office advises us that some of the detail in the chart is now obsolete. Consider it all decorative rather than informative. Chart is now in process of being brought up to date by AIF.

•

You can still be a charter subscriber to *Agricultural Chemicals* and have your file complete, starting with this first issue. We printed enough extra copies, we hope, to take care of the requests we anticipate may come from those inadvertently missed on the first mailing. We shall be glad to mail a sample copy to any one you think might be interested. Just send along his name.

•

COLORADO POTATO BEETLE



# BUG OF THE MONTH

## PRENTISS FOR PEST-TESTED *Basic Insecticides*

The Colorado Potato Beetle is just one of the many potato insects controlled by insecticides produced from Prentiss' Basic Agricultural Products. For the formulation of your potato insecticides we offer the following:

1. Cube Powder, finely milled, uniformly batch mixed and tested.
2. Micro-Mesh Wettable—a 50% DDT powder formulated for agricultural sprays, and milled to an average particle size of 1.5 microns.
3. Micro-Mesh Dry—A 50% DDT powder for blending in agricultural dusts, also milled to an average particle size of 1.5 microns.
4. 25% Water-Miscible DDT Concentrate—Ideal for use where emulsions as sprays are indicated.
5. Pyrethrum Powder—A specific for many agricultural pests. Finely ground and adapted for agricultural dusts where Pyrethrum is necessary.

Plan to use Prentiss Basic Agricultural raw materials and intermediate products in the production of your agricultural and livestock insecticides. R. J. PRENTISS & COMPANY, INC., 110 William Street, New York 7, New York. Plants: Brooklyn, New York and Newark, New Jersey.

**PRENTISS**

**RAW MATERIALS FOR AGRICULTURAL INSECTICIDES**